

A Guide To
Camponotus
ANTS
Of South Australia



Archie McArthur

"Archie McArthur continues that wonderful tradition of natural history writing at its best. This guide is the culmination of a lifetime's work on *Camponotus* ants. It is beautifully written and illustrated, and readily accessible to the general reader. Given the importance of ants in the Australian landscape, it is a welcome addition to our store of knowledge."

Allan Holmes
Chief Executive
Department for Environment
and Heritage

D. N.
Dr.
Archie

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ACKNOWLEDGEMENTS

This publication has been made possible by use of the facilities of the South Australian Museum, grants from Australian Biological Resources Survey, Mark Mitchell Trust, Friends of the South Australian Museum, help from B. Bolton, D. Burkhardt, C. Burwell, J. Forrest OAM, B. Hetterick, P. Hudson, R. Hutchinson, F. Koch, H. Landsberg, P. Lillywhite, the late Rev. B. Lowery SJ, E. G. Matthews, J. D. Majer, B. Merz, J. Pontin, R. Poggi, G. Sabine, S. O. Shattuck, R. Simms, the late R. Snelling, M. Uhlig, M. Vizek, S. von Wattenwyl, K. Walker, C. H. Watts, H. Zettel, D. Zimmermann, the South Australian Department for Environment and Heritage Biological Surveys and especially J. Weyland.

ISBN 9780980729108

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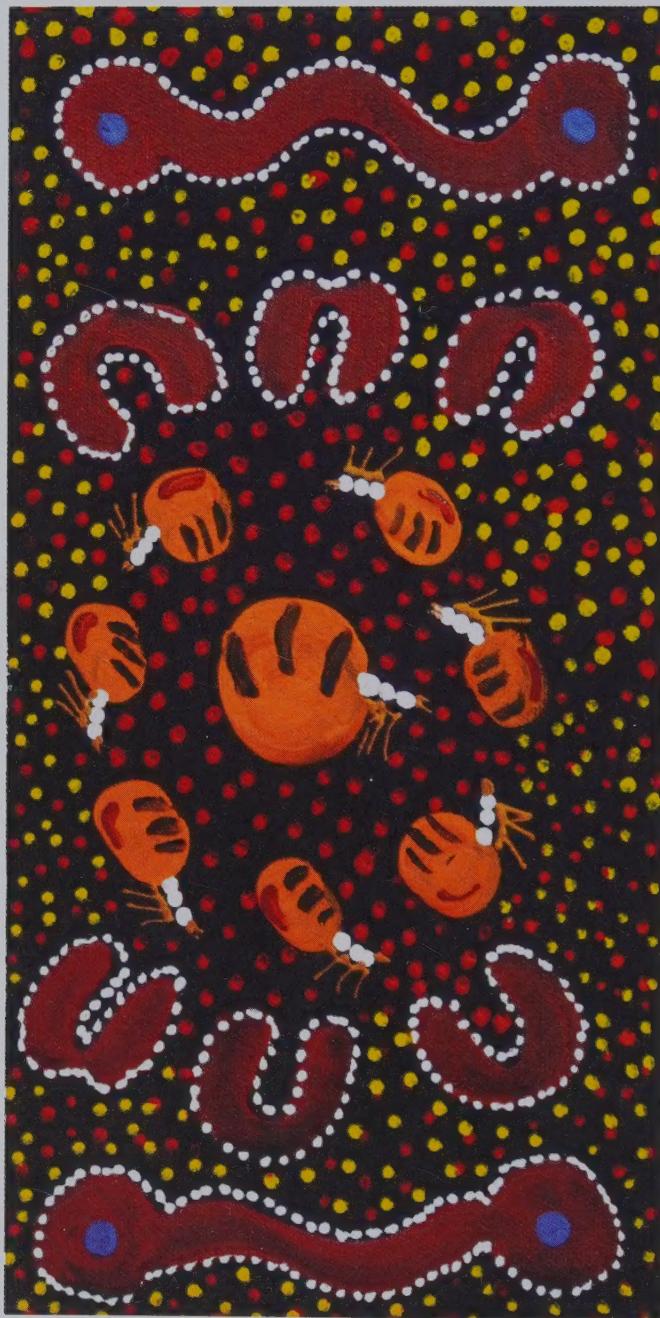
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Printed with help of Axiom Books
Adelaide

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Yerrampe, Honey Ants,
acrylic on canvas, by
Marjorie Wheeler,
Western Arrernte,
Ntaria community
(Hermannsburg),
MacDonnell Ranges,
Northern Territory, 2009
(Private collection).

The ‘honey-pot’ ant

For thousands of years, indigenous people of Central Australia used the “honey-pot” ant as a source of food (see painting previous page). These ants live in tunnels in the ground near mulga trees (see photo of typical mulga woodland on right). Aboriginal women using digging sticks forage for the ants with swollen abdomens. They hold the fore part of the ant in their fingers and suck out the contents of the swollen abdomen - nearly a millilitre of honey. These ants, known as “repletes”, are a caste within the colony. In times of plenty the minor workers known as the “forager caste” gather honey from the mulga leaves (phyllodes - see photo) and on returning to the nest, regurgitate it into the mouths of the repletes. The abdomens of the repletes become so distended they are unable to move (see photo where scale line = 1 mm). In times of drought, the repletes share their crop contents with their nest-mates and eventually return to their normal size.

A droplet of honey can sometimes be seen at a gland on the phyllode of mulga near its base as shown in the photo. The relationship between this ant and the mulga is mutualistic in that the ant community benefits from acquiring food while the mulga benefits from having its leaves (phyllodes) protected from leaf-eating insects by the ants.

Honey from “honey-pot” ants was analysed by Badger (later Sir Geoffrey) et al. 1956, where the ratio fructose : glucose was found to be 0.67, quite different from European bee honey.



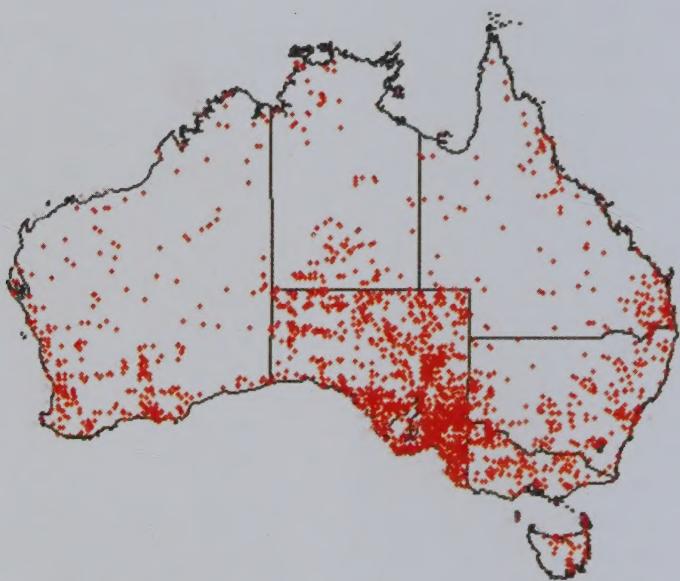
Mulga woodland, Burt Plain, Central Australia. Photo: P.A. Clarke, 2007.



The ant was described as *Camponotus inflatus* by Sir John Lubbock in 1880.



Phyllode of mulga showing honey droplet.



Map of the 5000 localities of specimens of *Camponotus*, revealing the vast collections in the South Australian Museum, referred to in this Guide.

FOREWORD

Since 1983 Archie McArthur, a farmer, has taken a closely detailed interest in ants and specifically in the genus *Camponotus*. Much of his time has been spent as an Honorary Research Associate at the South Australian Museum, where he has increased the ant collection to an enviable size. For that effort, he was awarded the Medal of the Order of Australia.

As a non-ant expert, I felt I had to ask the question, "Why *Camponotus*?" thinking, "All ants look alike, don't they?" I have subsequently been educated that this is most definitely not the case.

This book is meant for others like me – who have no previous knowledge of these fascinating, tiny creatures – in the hope that not only will she or he be drawn into the net of seeking to find out more about *Camponotus*, but on the way find hundreds of other species – sneaking about on tree trunks and flowers at night or by day, furtively hiding under stones in the forest near their underground nests, scampering over bush paths when they hear approaching footsteps. Everyone who knows Archie will testify that there are few tracts of South Australian bush that he hasn't traversed in search of ants, and many tracts elsewhere that he has scoured in search of quarry that few people would think of hunting.

Of all the world's evolved animals, ants are thought to be the longest survivors. They are social insects in which individuals, divided into castes under a queen who is the mother of all ants in the colony, are "workers", each with distinct duties. Workers care for the young and live longer than one generation. Without ants, the world's land environment would be very different—they are great garbage collectors—removing excreta from sap-sucking insects, carrying seeds to revegetate degraded sites and even aerating the soil. Others, however, are less useful, tending and protecting sap-sucking aphids, particularly on exotic plants, often causing nuisance to farmers and gardeners.

In 1979 this Museum published *A Guide to Ants of South Australia* by Dr John Greenslade, which for the next 20 years provided the only practical means of identifying ant genera in Australia. Dr Greenslade's observations of relationships between ants and plants caused him to propose ants as indicators of environmental sustainability. He showed that stable environments held great plant and animal species diversity, including many ant species living side by side. This publication stimulated Archie to start collecting and studying ants before concentrating on the large, diverse genus *Camponotus*. The result is this publication *A Guide to Camponotus Ants of South Australia*.

I hope this work will help readers to recognise that, as they walk about the bush, their gardens, or through streets and parks, there are busy *Camponotus* ants nearby, who, by night and day, are adding to our enjoyment of the world.

Professor Suzanne Miller
Director
South Australian Museum

THE GENUS *CAMPONOTUS*

In 1861, soon after the return to Europe of the Austrian Scientific Expedition from a round the world voyage in His (Austrian) Majesty's Ship Novara, Gustav L. Mayr, in the Naturhistorisches Museum, Vienna, established the genus *Camponotus*. He included *Camponotus aeneopilosus* Mayr which had been collected by the Expedition in Sydney. The ant family (Formicidae) has been divided into eight subfamilies in South Australia. The genus *Camponotus* is placed in Formicinae and how to recognise this subfamily is shown on page 12. How to recognise *Camponotus* from the other eleven genera in this subfamily in South Australia is shown on page 14. (For more details of Formicidae family and genus see Greenslade 1979 and Shattuck 1999 and for descriptions of *Camponotus* species from other parts of Australia see McArthur 2007.)

Colonies of *Camponotus* comprise many sterile females (workers), at least one egg laying female (queen), and a number of winged males and winged females which are waiting to leave the nest for their annual nuptial flight. A few records of dates of nuptial flights are shown on page 10.

An illustrated key to identification of the 70 species of *Camponotus* which have been described from South Australia to June 2009 is shown on pages 18-107. A consolidated key is shown on pages 110-114.

Camponotus workers divide into castes for performing the tasks associated with the maintenance of a complex living organism. The variation in shape, colour and size of the castes in a colony of *Camponotus* workers makes the identification of species much more difficult compared with identification of species where all workers are identical. This key is based on characters of minor workers except where stated.

Colonies of *Camponotus* species vary in size: some species are widespread, others are confined to small areas, some are in sandy soil, others in heavier soil. Most species excavate nests in the soil, some have nests above ground constructed of carton material and some in rotten logs. Two species live in galleries in branches of trees, where major workers with their flat truncated heads guard the entrance to their nest (McArthur & Shattuck, 2001). Most *Camponotus* species are nocturnal but some forage diurnally.

Species of *Camponotus* are known to have mutual relationships with butterflies (Braby, 2000), to assist in revegetating disturbed sites by transporting seed (McArthur, 2003) and to have lived for 23 years (Haskins, 1992).

Magnification of 20 to 80x is required to interpret this key.



From Karl von Scherzer: Reise der Österreichischen Frigate Novara um die Erde. Bd. 1, 2. Aufl., Wien 1864.

Foto Schumacher, Naturhistorisches Museum Wien.



Camponotus terebrans major, medium and minor worker castes gathering syrup sprayed on sand in Beachport Conservation park.

BASIC UNITS OF CLASSIFICATION

“Species” is the basic unit of classification of ants and in this Guide species are considered as groups of interbreeding populations which do not interbreed with other groups (Mayr 1942). About 1400 species of *Camponotus* from the world have been described and of these, 70 are known in South Australia. The genus *Camponotus* and 11 other genera comprise the subfamily Formicinae (pages 14 -17) which, with other subfamilies, form family Formicidae (the ants), which with other families form the order Hymenoptera (ants, bees, wasps), which with other orders form the class Insecta, which with other classes form the phylum Arthropoda, which with other phyla form the animal kingdom, Animalia.

The exoskeleton of ants is composed of adjoining plates of hard material as in the body of modern aircraft but some plates have a flexible cuticle between them. These plates have names, eg clypeus etc as shown on Page 119.

The following pages provide a dichotomous key for identifying 70 species of *Camponotus* from South Australia.

IDENTIFICATION OF CAMPONOTUS SPECIES

1. The dichotomous (= forked) key shows 69 couplets of paired diagnoses. This permits one to choose between one of two directions. Starting at couplet (1) page 18, if the fore femur is swollen, go to couplet 2, if not swollen, go to couplet 3 and so on. Page numbers are given. A consolidated list of couplets is given on Pages 110 to 114.

2. By using the “filter” facility of Microsoft Excel. This requires copying the table of characters on pages 115 and 116 into your computer. The legend for these characters is given on pages 117.

CASTES

Most ants are sterile females and are known as workers. In some species of *Camponotus* their size increases from the smallest minors to the largest majors and are known as polymorphic. Other species are dimorphic and lack mid sized workers. Minor workers are the food gatherers and are more frequently encountered away from the nest, than other castes. Because of which, this key is based on characters of minors. Page 72 is an exception, there, major workers are required to separate two species.

Males and fertile females begin their lives with wings as shown on page 11.

IMAGES

Species are represented by photographs in front of head view and lateral view of head, mesosoma, node and gaster of minor workers and where available similar photographs of major workers. Scale lines = 1 mm.

GENERAL BIOLOGY

Camponotus ants play an important role in the environment. This section explores relationships with soil, nest entrances, plants, and other insects, as well as avoiding predators and nuptial flights.

1. NEST ENTRANCES



Camponotus aurocinctus

At Ngarkat Conservation Park in sandy soil. The spoil from the excavation has been placed in a lunette shaped mound a few cm from the entrance. Photo: R. S. Bunney.



Camponotus ceriseipes

At Mullewa, Western Australia in sandy soil. The spoil from the excavation has been deposited evenly on a mound surrounding the entrance which is indicated.



Camponotus clarior

At Danggali Conservation Park. The entrance to the nest is indicated. It is about 1 metre above ground in a branch of a mallee directly above the apex of the cone of sand which over many years had been excavated from the nest. The particular branch of the mallee has been hollowed out by another insect and is didgeridoo-like. The ant colony lives in the soil surrounding the mallee.



Camponotus consobrinus

At Mount Barker in heavy soil. The photo was taken in the autumn just prior to the entrance being sealed up from inside, presumably because the colony was settling down for the winter.

Photo R. J. Lavigne



Camponotus gasseri

At Ferguson Conservation Park. These ants nest in trees in galleries hollowed out by another insect, usually a species of termite particularly in red gums. In the photograph, the head of a major worker can be seen guarding the entrance.

Photo: G. Weber.



Camponotus gouldianus

At Danggali Conservation Park in heavy soil in swale. The entrance is indicated and is near the top of a turret made of clay. During flooding, water would not penetrate the nest until the depth exceeded 50 mm.



Camponotus evae zeuxis

At Kimba. These ants make a carton nest above ground usually in *Triodia* and have a distinctive smell of coconut.

Photo: J. Grund.

2. RELATIONSHIPS WITH PLANTS.

Many ant species transport seed, particularly when it is plentiful, sometimes across distances of over 100 metres. Some species store it for consumption later and in this process most of the seed is eaten and does not get a chance to germinate but a few seeds do germinate after being discarded along the route to the nest. *Camponotus terebrans* is known to transport the seeds of *Acacia sophorae* from its source towards its nest and in the process it bites off and swallows the *oleosome* of the seed. Removal of the *oleosome* does not affect germination of the seed. These ants appear to have no desire to eat the seed. The seed is discarded some distance from its source and is capable of germination. The ant and the plant mutually benefit – the ant receives food and the plant has its sphere of influence increased. In Beachport Conservation Park many hundred hectares of sand-drift (a result of by rabbit devastation in the early 20th century) has been revegetated by *Camponotus terebrans* transporting seeds of *Acacia sophorae*. *Camponotus terebrans* is generally the first ant to colonise sandy sites that have been disturbed by earth moving eg rabbits, mining.



Camponotus terebrans transporting seed of *Acacia sophorae* towards its nest in Beachport C.P.



Acacia sophorae seed transported by *Camponotus terebrans* on sand in Beachport.



Seed of *Acacia sophorae* attached to its pod by the oleosome in Beachport C.P.



Young plants of *Acacia sophorae* stabilising sand-drift in Beachport C.P.

3. RELATIONSHIPS WITH OTHER INSECTS

Camponotus gasseri.

Many red gums in South Australia are hosts to colonies of *Camponotus gasseri*. Often the head of a major worker may be seen blocking and guarding the entrance to the nest as shown on page 7. The 'door keeper' uses its head like a cork to close the circular entrance, the diameter of which is only slightly greater than the worker's head. The heads of major workers and queens are more or less circular in cross section with the anterior portion truncated, flat and often deeply and coarsely sculptured, camouflaging the entrance when it is blocked. When the 'doorkeeper' moves further in from the entrance, there is enough space to allow a nest mate to pass in or out. Major workers act as living doors – they have evolved a characteristic flat or phragmotic face (from Greek *phragmos*, 'fence' or 'fencing in'). It appears that workers wishing to gain entry communicate to the 'door keeper' and do so by making contact with its clypeus or mandibles, as all other sensitive parts, notably the eyes and antennae, are too far out of reach to receive stimuli from outside the entrance. It is generally believed that Australian ants are incapable of excavating the hard wood and that the galleries are constructed by termites.

The photos show sections of a red gum tree *Eucalyptus camaldulensis* felled for road widening at Glen Osmond and once home for a colony of *Camponotus gasseri*. The colony comprised 1 wing-less female (the queen), 1242 major and minor workers, several winged females and 1 winged male. The length of the gallery was about 40 cm with an average diameter of about 1 cm.



Colonies of *Camponotus gasseri* occupy galleries hollowed out by other insects in branches of trees.



Sections of log of *Eucalyptus camaldulensis* occupied by a colony of *Camponotus gasseri*.

Camponotus consobrinus, *Camponotus nigriceps* and *Camponotus terebrans* have symbiotic relationships with *Ogyris* spp butterflies as described in Braby 2000.

4. AVOIDING PREDATORS

In the north east of South Australia, *Camponotus terebrans* has been observed to use tunnels to travel from its nest to a food tree, presumably to avoid predation. The tunnel is about 10 mm in diameter and is constructed in sand about 30 mm below the surface. On the surface, just above the tunnel, a low mound of sand is conspicuous, as shown in the photo. On excavating below the mound, *Camponotus terebrans* could be seen travelling to and fro in the tunnel. The tunnel in the photo connected a nest near the centre of the dry creek to a Coolabah tree on the bank.



5. NUPTIAL FLIGHTS

The annual life cycle of *Camponotus* begins with a nuptial flight when young winged males and winged females from all the colonies of a species fly off. Mating takes place in the air and the young queen stores the semen she has collected in a special sac. The males soon die while the young queen, if she survives predation, searches for a suitable nest site and if successful, discards her wings, digs a hole, starts laying eggs and establishes a new colony. Caryl P Haskins collected a queen near Sydney and put her in an artificial nest in New York, USA, where for 23.2 years, using her stored semen from when she was mated, she produced many off-spring.

Dates of Nuptial flights of some *Camponotus* species observed in South Australia.

Species	Locality	Collector	Date
<i>Camponotus consobrinus</i>	Belair	S. A. Parker	20/1/91
<i>Camponotus consobrinus</i>	Upper Sturt	A. Smith	22/1/92
<i>Camponotus consobrinus</i>	Salisbury	J. Knight	28/12/94
<i>Camponotus consobrinus</i>	Tusmore	H. Mincham	11/1/95
<i>Camponotus consobrinus</i>	Stirling	R. Foster	31/1/98
<i>Camponotus consobrinus</i>	Warrawong	R. G. Simms	15/2/97
<i>Camponotus consobrinus</i>	Nailsworth	L. Belotti	18/1/98
<i>Camponotus consobrinus</i>	Welland	R. Glatz	12/1/98
<i>Camponotus consobrinus</i>	Houghton	J. Rathbone	10/2/01
<i>Camponotus consobrinus</i>	Dernacourt	J. Rathbone	5/01/02
<i>Camponotus consobrinus</i>	Mount Barker	R. Lavigne	6/02/05
<i>Camponotus consobrinus</i>	Fullarton	P. Horton	20/12/07
<i>Camponotus claripes</i>	Mount Barker	R.J. Lavigne	26/04/06
<i>Camponotus gouldianus</i>	Calperum	G. L. Howie	3/10/96
<i>Camponotus evae zeuxis</i>	Kimba	J. Grund	3/10/96
<i>Camponotus piliventris</i>	Mount Barker	R. J. Lavigne	28/03/05
<i>Camponotus terebrans</i>	Kangaroo Is.	A. Young	23/10/06



Camponotus terebrans Female above and Male below with arrows pointing to ocelli which are not possessed by workers other than largest majors. Included is a posterior view of its penis enlarged.

SUBFAMILY FORMICINAE.

Formicinae have an anus fringed with short setae



Photo of *Camponotus aurocinctus*. The enlargement shows its anus, a multi function orifice fringed with short setae through which offensive chemicals are also sprayed. *Camponotus* have no sting.



Photo of a member of sub-family Myrmecinae (a non Formicinae ant) and its sting.

Some species of ants in primitive subfamilies have retained stings, inherited from their ancestors. The sting is used in defence and in anaesthetising and capturing prey. Ants in the subfamily Formicinae including *Camponotus* are more advanced and have replaced the sting with an orifice through which chemical substances are sprayed onto the prey. It is fringed with short setae as shown with *Camponotus aurocinctus* above.

FORMICINAE ANTS HAVE ONE NODE AND NOT TWO.



Photo of a member of sub-family Myrmicinae (a non Formicinae ant) showing its two nodes.

KEY TO GENERA IN SUBFAMILY FORMICINAE (following Greenslade 1979)

Antennae with 12 segments (including scape) → page 15

Antennae with 11 segments (including scape)



Stigmacros worker. The angle of the propodium is armed with a couple of teeth



Acropyga worker. Very small overall with small compound eyes each with less than 40 facets, palps short, uncommon



Plagiolepis worker. Small brownish.

KEY TO GENERA IN SUBFAMILY FORMICINAE (cont.)

Antennae attachment distant from anterior margin of clypeus → page 17

— Antennae attachment close to anterior margin of clypeus



Paratrechina worker. A few pairs of stout long erect setae on propodeum and mesosoma.



Myrmecorhynchus worker. Head elongate, mandibles with at least 7 teeth in smallest workers. Popodeal spiracle circular.



Melophorus worker. Propodeal spiracle elongate. J shaped setae under head.

KEY TO GENERA IN SUBFAMILY FORMICINAE (cont)



Notoncus worker. Frontal carinae mostly straight. There are two groups of species: one most common in South Australia and has projections on anterior dorsum whereas in the other group it is smooth.



Prolausius worker. Smooth and glossy. The propodeal spiracle is circular and is situated at the corner of the declivity.

KEY TO GENERA IN SUBFAMILY FORMICINAE (cont)



Opisthopsis worker. Distinguished by large eyes near the vertex.



Polyrhachis worker. Spines on propodeum and node



Calomyrmex worker. Pronotum wider than long in dorsal view.

→ If otherwise, go to page 18 to begin key to identification of *Camponotus* species.

KEY TO CAMPOONOTUS SPECIES

1 Fore femurs about double
the thickness of other
femurs.....2 Page 32
1 Femurs all about the same
thickness.....3 Page 18



*A number in parenthesis indicates the preceding couplet

3 (1) Anterior clypeus concave, projecting,
corners sharp.....4 Page 34



3 (1) Anterior clypeus otherwise....7 Page 19, 20



7 (3) Top of eyes within half eye length from corners, head sides straight, vertex flattish.

.....8 Page 38



Camponotus afflatus



Camponotus capito



Camponotus capito ebinithorax



Camponotus ephippium



Camponotus inflatus



Camponotus pitjantjataae



Camponotus tasmani

7 (3) Eyes or head sides otherwise (Examples Pages 20-24).....14 Page 25

7 (3) Eyes or head sides otherwise (Examples Pages 20-24).....14 Page 25



Camponotus aeneopilosus



Camponotus andyyoungi



Camponotus arcuatus



Camponotus arenatus



Camponotus armstrongi



Camponotus aurocinctus



Camponotus ceriseipes



Camponotus chalceus



Camponotus christmansensis



Camponotus churchetti



Camponotus cinereus amperei



Camponotus claripes

7 (3) Eyes or head sides otherwise (Examples Pages 20-24).....14 Page 25



Camponotus claripes elegans



Camponotus claripes minimus



Camponotus cowlei



Camponotus donnellani



Camponotus evae zeuxis



Camponotus fergusoni



Camponotus fraseri



Camponotus gibbinotus



Camponotus gouldianus



Camponotus guidae



Camponotus hartogi



Camponotus innexus

7 (3) Eyes or head sides otherwise (Examples Pages 20-24).....14 Page 25



Camponotus intrepidus



Camponotus johnclarki



Camponotus judithmorrisae



Camponotus leae



Camponotus longifacies



Camponotus lownei



Camponotus malleensis



Camponotus nigroaeneus divus



Camponotus oetkeri



Camponotus owensae



Camponotus palkura



Camponotus pawseyi

7 (3) Eyes or head sides otherwise (Examples Pages 20-24).....14 Page 25



Camponotus perjurus



Camponotus philwardi



Camponotus piliventris



Camponotus rufus



Camponotus rufonigrus



Camponotus rufus



Camponotus samueli



Camponotus scotti



Camponotus scratius



Camponotus simpsoni



Camponotus spenceri



Camponotus sponsorum

7 (3) Eyes or head sides otherwise (Examples Pages 20-24).....14 Page 25



Camponotus stefani



Camponotus terebrans



Camponotus tricoloratus



Camponotus triodiae



Camponotus tristis



Camponotus whitei



Camponotus wiederkehri



Camponotus woodroffeensis

14 (7) Iridescent, neck attached to head well below vertex.....

.....*perjurus* Page 46

14 (7) Neck attached to head near vertex.....15 Page 25



15 (14) With a few J shape setae on underside of head....16 Page 48

15 (14) Without J shape setae on underside of head.....25 Page 25



25 (15) Coarsely punctate.....26 Page 58
25 (15) Not coarsely punctate.....27 Page 26



27 (25) Mesosoma squat ($L < 2H$) (Examples Pages 26-27).....	28 Page 60
27 (25) Mesosoma elongate ($L > 2H$) (Examples Pages 28-30).....	46 Page 80

(Note re Couplet 27: To assist the reader in separating these two groups, photos of lateral views of the squat group are shown on pages 26 and 27 with the elongate group on pages 28 - 30.)



Camponotus andyyoungi



Camponotus arcuatus



Camponotus armstrongi



Camponotus claripes



Camponotus claripes minimus



Camponotus cowlei



Camponotus evae zeuxis



Camponotus fraseri



Camponotus gibbinotus

27 (25) Mesosoma squat ($L < 2H$) (Examples Pages 26-27).....28 Page 60
27 (25) Mesosoma elongate ($L > 2H$) (Examples Pages 28-30).....46 Page 80

(Note re Couplet 27: To assist the reader in separating these two groups, photos of lateral views of the squat group are shown on pages 26 and 27 with the elongate group on pages 28 - 30.)



Camponotus guidae



Camponotus lownei



Camponotus oetkeri



Camponotus rudis



Camponotus samueli



Camponotus scratus



Camponotus simpsoni



Camponotus triodiae



Camponotus tristis



Camponotus woodroffeensis



Camponotus aeneopilosus



Camponotus chalceus



Camponotus christmasensis



Camponotus churchetti



Camponotus cinereus amperei



Camponotus claripes elegans



Camponotus fergusoni



Camponotus hartogi



Camponotus innexus



Camponotus intrepidus

27 (25) Mesosoma elongate (L > 2H) (Examples).....46 Page 80.



Camponotus johnclarki



Camponotus judithmorrisae



Camponotus longifacies



Camponotus malleensis



Camponotus nigroaeneus



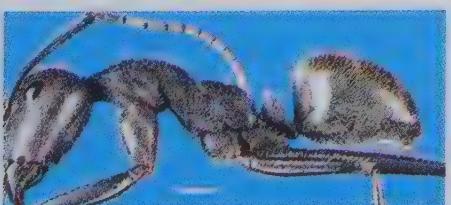
Camponotus palkura



Camponotus pawseyi



Camponotus philwardi



Camponotus piliventris



Camponotus rufus

27 (25) Mesosoma elongate ($L > 2H$) (Examples).....46 Page 80.



Camponotus scotti



Camponotus spenceri



Camponotus sponsorum



Camponotus stefani



Camponotus tricoloratus

48 (46) Node long (length > 1/2 height).....49 Page 82

48 (46) Node higher than long.....52 Page 86



53 (52) Mesosoma with plentiful erect short setae (length < eye length).....54 Page 88

53 (52) Mesosoma without plentiful erect short setae.....55 Page 90



55 (53) Gaster with fine pubescence hiding integument.....56 Page 90

55 (53) Gaster without fine pubescence hiding integument.....57 Page 92



59 (57) Finely punctate.....60 Page 94

59 (57) Otherwise.....62 Page 98



2 (1) Propodeal dorsum convex.....*gasseri*
 2 (1) Propodeal dorsum near straight.....*macrocephalus*

Camponotus gasseri

Integument: glossy

Frontal carinae width: > 1/3 HW

Erect setae under head: absent

Erect setae tibiae: indistinct or flat

Erect setae mesosoma: < 6

Short setae on clypeus: 0

Head width: 0.9 - 1.6 mm, head length: 1 - 1.7 mm.

Fore femurs: thick; metanotum: with spiracles raised above dorsum; propodeum hemispherically domed.

Major worker anterior head: striate and coarsely punctate, sharply truncate.

Dimorphic.



Synonyms: *gasseri coloratus* Wheeler; *gasseri lysias* Forel; *gasseri obtusitruncatus* Forel.

Camponotus macrocephalus

Integument: glossy

Frontal carinae width: > 1/3 HW

Erect setae under head: absent

Erect setae tibiae: indistinct or flat

Erect setae mesosoma: < 6

Short setae on clypeus: 0

Fore femurs: thick.

Major worker: anterior head deeply striate lengthways and at an angle, coarsely punctate, sharply truncate.

Minor worker: anterior clypeal margin convex, projecting past mandibular insertions.

Head width: 0.9 - 1.7 mm, head length: 1.1 - 1.9 mm.

Dimorphic.



Etymology: macro = large, cephalus = head (applies to major workers).

Synonyms: *fictor* Forel; *fictor augustulus* Viehmeyer; *semicarinatus* Forel.



Camponotus gasseri major and minor worker



Camponotus macrocephalus major and minor worker

4 (3) Underside of head with erect setae.....	5 Page 34
4 (3) Underside of head without erect setae.....	6 Page 36
5 (4) Head yellow.....	<i>clarior</i>
5 (4) Head brown or black.....	<i>nigriceps</i>

Camponotus clarior

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: present

Erect setae tibiae: raised to < 30°

Erect setae mesosoma: > 6

Short setae on clypeus: not overlapping

Anterior margin of clypeus: with projecting corners,
concave between; head yellow.

Polymorphic.

Head width: 1.9 - 3.9 mm, head length: 2.5 - 3.5 mm.



Etymology: clarius = yellow.

Synonym: *nigriceps clarior* Forel

Camponotus nigriceps

Integument: glossy

Frontal carinae width: >1/3 HW

Erect setae under head: present

Erect setae tibiae: raised to < 30°

Erect setae mesosoma: > 6

Short setae on clypeus: not overlapping

Anterior margin of clypeus with projecting corners,
concave between, head black.

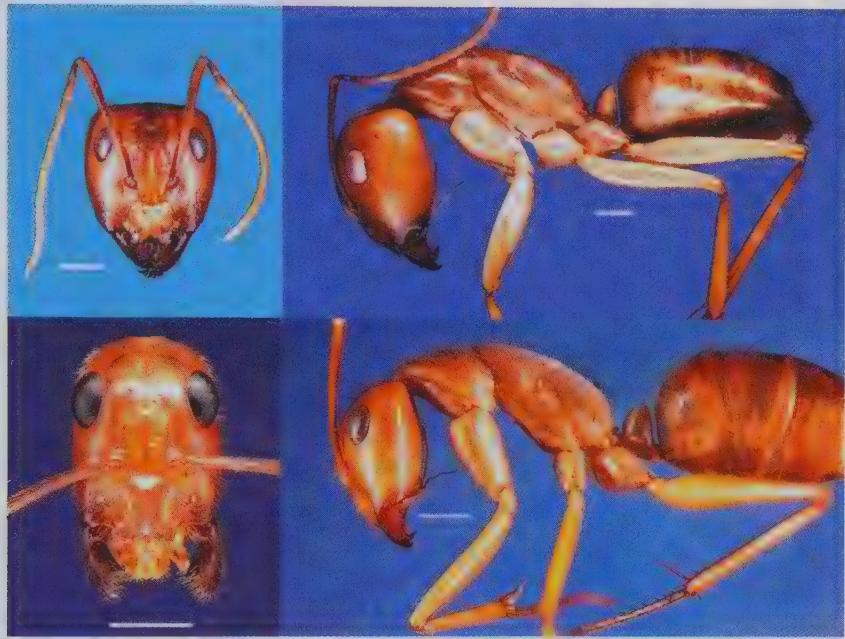
Polymorphic.

Head width: 1.6 - 4.1 mm, head length: 2.2 - 4.1 mm.



Etymology: nigra = black, cephalicus = relating to head.

Synonym: *nigriceps perthiana* Wheeler.



Camponotus clarior major and minor worker



Camponotus nigriceps major and minor worker

6 (4) Anterior gaster lighter than posterior.....*consobrinus*
 6 (4) Anterior gaster not lighter than posterior.....*loweryi*

Camponotus consobrinus

Integument: glossy

Frontal carinae width: about 1/3 HW

Erect setae under head: absent

Erect setae tibiae: raised to 10°

Erect setae mesosoma: > 6

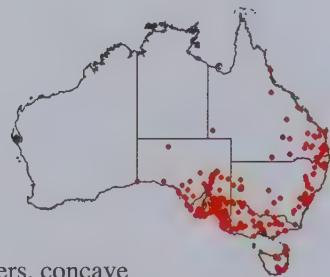
Short setae on clypeus: not overlapping

Anterior margin of clypeus: with projecting corners, concave between.

Anterior gaster: lighter colour than posterior.

Polymorphic.

Head width: 1.3 - 3.3 mm, head length: 1.75 - 3.4 mm.



Etymology: *consobrinus* = cousin, thought to be a relative of *Formica herculaenus*.

Common name: sugar ant.

Synonyms: *consobrinus dimidiatus* Roger; *consobrinus obniger* Forel;

Camponotus loweryi

Integument: glossy

Frontal carinae width: about 1/3 HW

Erect setae under head: absent

Erect setae tibiae: indistinct, < 5°

Erect setae mesosoma: > 6

Short setae on clypeus: not overlapping

Anterior margin of clypeus: with projecting corners, concave between.

Anterior gaster: nearly uniform in colour.

Head width: 1.6 - 4.1 mm, head length: 2.2 - 4.3 mm.

Polymorphic.



Etymology: named after Rev. Bede Lowery SJ.



Camponotus consobrinus major and minor worker



Camponotus loweryi major and minor worker

8 (7) All red.....*afflatus*
8 (7) Not all red.....9 Page 38

9 (8) Scapes with plentiful erect short setae.....*tasmani*
9 (8) Scapes without erect short setae10 Page 40

Camponotus afflatus

Integument: glossy
Frontal carinae width: < 1/3 HW
Erect setae under head: absent
Erect setae tibiae: indistinct or flat
Erect setae mesosoma: < 6
Short setae on clypeus: absent
Head width: 1.3 - 1.6 mm, head length: 1.5 - 1.9 mm.



Clypeus anterior margin convex projecting.

Camponotus tasmani

Erect setae scapes: present
Integument: glossy
Frontal carinae width: < 1/3 HW
Erect setae under head: present
Erect setae tibiae: raised to > 10°
Erect setae mesosoma: > 6
Short setae on clypeus: overlapping
Head width: 1.5 - 3.5 mm,
Head length: 1.8 - 3.5 mm.



Red and black, entirely clothed in erect whitish setae.

Major worker: anterior clypeal margin projecting, median section with two blunt teeth separated by a shallow concavity; front of head coarsely and finely punctate.

Minor worker: Front of head clothed in short white setae hiding integument; anterior clypeal margin strongly projecting, convex.



Camponotus afflatus minor worker



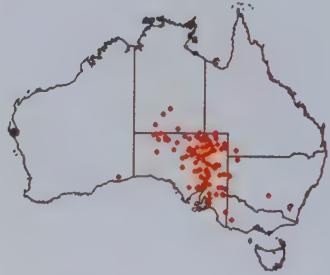
Camponotus tasmani major and minor worker

10 (9) Without erect setae on underside of head.....11 Page 40
 10 (9) With erect setae on underside of head.....12 Page 42

11 (10) Propodeum concave.....*capito*
 11 (10) Propodeum not concave, mostly black.....*pitjantjataiae*

Camponotus capito

Integument: glossy
 Frontal carinae width: about 1/3 HW
 Erect setae under head: absent
 Erect setae tibiae: indistinct or flat
 Erect setae mesosoma: < 10
 Propodeum: concave
 Short setae on clypeus: very sparse
 Head sides: tapering to the front
 Head width: 1.65 - 3.35 mm, head length: 1.85 - 3.2 mm.



Camponotus pitjantjataiae

Integument: finely punctate
 Frontal carinae width: about 1/3 HW
 Erect setae under head: absent
 Erect setae tibiae: flat
 Erect setae mesosoma: >10, length < eye length
 Short setae on clypeus: fine, not overlapping
 Head width: 1.9 - 2.6 mm, head length: 1.8 - 2.3 mm.



Black; similar to *Camponotus inflatus* but with less pilosity.

Etymology: named after the Aboriginal inhabitants of the Musgrave Ranges in the north of South Australia where this species is found.



Camponotus capito major and minor worker



Camponotus pitjantjataae minor worker

12 (10) Propodeum concave, mesosoma elongate13 Page 44
12 (10) Propodeum not concave, mesosoma squat*inflatus*

..

Camponotus inflatus

Integument: finely punctate

Frontal carinae width: > 1/3 HW

Erect setae under head: > 20

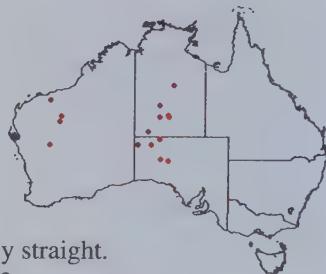
Erect setae tibiae: raised to < 5°

Erect setae mesosoma: > 20

Short setae on clypeus: not overlapping

Anterior clypeal margin: median section mostly straight.

Head width: 1.3 - 2.4 mm, head length: 1.5 - 2.3 mm.



Common name: Honey-Pot Ant.

Aboriginal name: tjala

Etymology: fasciatus = bands or stripes, auro = golden, named inflatus because of its gaster swelling to > 1 ml in volume.

Synonym: *aurofasciatus* Wheeler



Camponotus inflatus major and minor worker

13 (12) Tibiae with short setae raised to 30° *ephippium*
 13 (12) Tibiae without raised up short setae *capito ebinithorax*

Camponotus ephippium

Integument: glossy

Frontal carinae width: $> 1/3$ HW

Erect setae under head: present

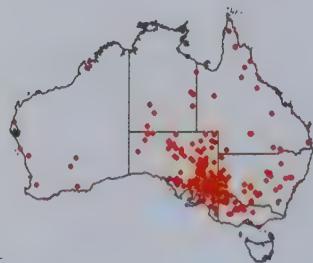
Short setae tibiae: raised to $> 10^{\circ}$

Short setae scape: indistinct or $< 5^{\circ}$

Erect setae mesosoma: > 10

Short setae on clypeus: overlapping

Head width: 1.6 - 3.8 mm, head length: 1.9 - 3.6 mm.



Variations of red and black, occasionally lighter; mostly glossy. Major worker: anterior clypeal margin feebly projecting, median section concave, bounded by two blunt teeth. Minor worker: most of ant covered with fine short white overlapping setae, in places hiding integument; about 8 teeth.

Etymology: Latin *ephippium* = horse cloth.

Camponotus capito ebinithorax

Integument: glossy

Frontal carinae width: $< 1/3$ HW

Erect setae under head: present

Erect setae tibiae: indistinct or flat

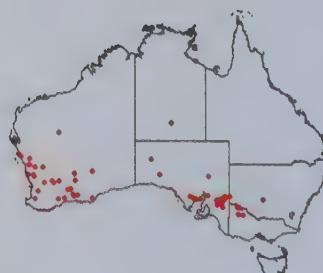
Erect setae mesosoma: < 6

Short setae on clypeus: present

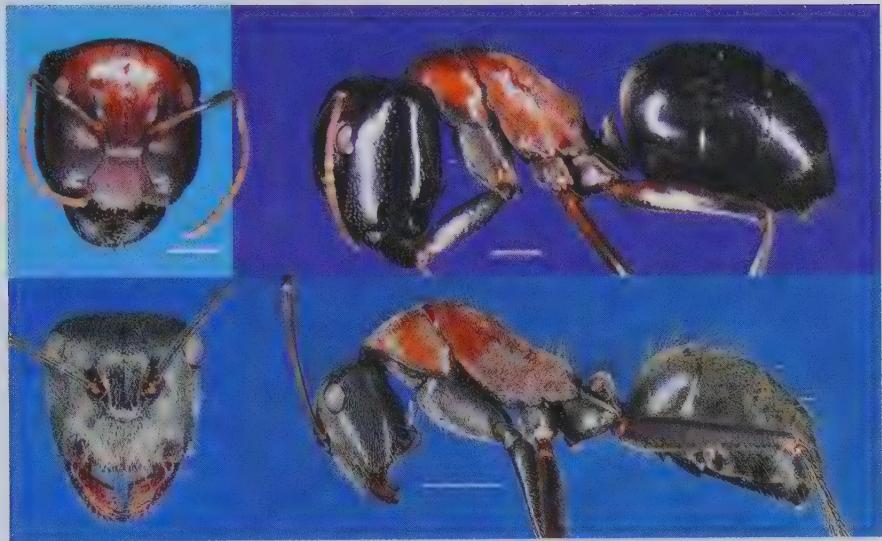
Head: nearly square

Head width: 1.5 - 3 mm

Head length: 1.6 - 2.95 mm.



Very similar to *Camponotus capito* but having erect setae on the underside of head.



Camponotus ephippium major and minor worker



Camponotus capito ebinithorax major and minor worker

Camponotus perjurus

Integument: glossy, iridescent

Frontal carinae width: about 1/3 HW

Setae under head: erect setae absent, a few

J shaped near mouth

Erect setae tibiae: indistinct or flat

Erect setae mesosoma: > 6

Short setae on clypeus: not overlapping

Head width: 1.2 - 1.8 mm, head length: 1.9 - 2.3 mm.



Unique head for the genus, rear head acute, with pronotum attached to head well below vertex resembling attachment in *Iridomyrmex purpureus*; anterior clypeal margin projecting, convex, mostly red-brown with gaster darker. Major worker not yet described.

Etymology: perjurus = lying about one's true nature.

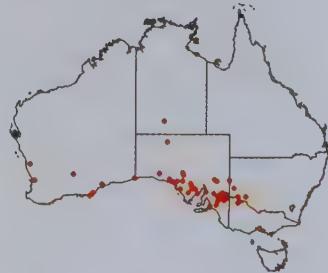


Camponotus perjurus minor worker

16 (15) Scape with distinct erect short setae.....	17 Page 48
16 (15) Scape without distinct erect short setae.....	18 Page 50
17 (16) Summit of node convex.....	<i>gouldianus</i>
17 (16) Summit of node angular, gaster not hidden by pubescence.....	<i>terebrans</i>

Camponotus gouldianus

Integument: partly hidden by setae
 Frontal carinae width: < 1/3 HW
 Erect setae under head: plentiful and J shaped
 Erect setae tibiae: raised to > 50°
 Erect setae mesosoma: > 50
 Short setae on clypeus: plentiful
 Node summit: bluntly rounded.
 Head width: 1.6 - 4.7 mm, head length: 1.8 - 4.3 mm.
 Polymorphic.



Camponotus terebrans

Integument: glossy
 Frontal carinae width: < 1/3 HW
 Erect setae under head: plentiful and J shaped
 Erect setae tibiae: raised to > 50°
 Erect setae mesosoma: > 10
 Short setae on clypeus: not overlapping
 Node summit: angular
 Head width: 1.1 - 3.6 mm, head length: 1.3 - 3.3 mm.
 Polymorphic.



Etymology: Latin, *terebro* = to bore out.

Synonym: *latrunculus victoriensis* Santschi; *myoporus* Clark; *testaceipes* Smith.



Camponotus gouldianus major and minor worker



Camponotus terebrans major and minor worker

18 (16) Entirely black, plentiful long erect setae, plentiful flat-lying short setae.....
.....*owensae*
18 (16) Not all black, with a few scattered long erect setae.....19 Page 52

Camponotus owensae

Integument: glossy

Frontal carinae width: about 1/3 HW

Erect setae under head: plentiful and J shaped

Erect setae tibiae: raised to 10°

Erect setae mesosoma: > 6

Short setae on clypeus: plentiful

Head width: 1.6 - 2 mm, head length: 2 - 2.4 mm.

Propodeum: with a wide concavity and a posterior hump;

Node: anterior face much shorter than posterior.

Polymorphic.



Etymology: named after its collector, Helen Owens.



Camponotus owensae minor worker

19 (18) Metanotal groove depressed below the level of the anterior propodeum.....	20 Page 52
19 (18) Metanotal groove indistinct or angular.....	21 Page 54
20 (19) Mesonotum and propodeum yellowish.....	<i>arenatus</i>
20 (19) Propodeum reddish.....	<i>aurocinctus</i>

Camponotus arenatus

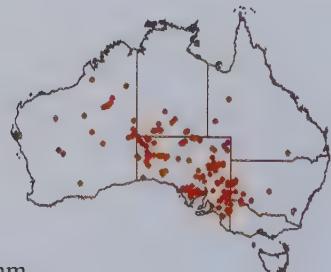
Frontal carinae width: < 1/3 HW
 Erect setae under head: some
 Erect setae tibiae: indistinct or flat
 Erect setae mesosoma: > 50
 Short setae on clypeus: plentiful
 Head width: 1.5 - 1.8 mm, head length: 1.9 - 2.2 mm.
 Anterior pronotum red to black, darker than posterior mesonotum



Etymology: Latin, arena = sandy, because of its sandy habitat.

Camponotus aurocinctus

Integument: finely punctate
 Frontal carinae width: < 1/3 HW
 Erect setae under head: present
 Erect setae tibiae: indistinct or flat
 Erect setae mesosoma: about 10
 Short setae on clypeus: fine
 Head width: 1.6 - 4.9 mm, head length: 2 - 4.1 mm.



Mesosoma red to black; metanotal groove depressed below level of anterior region of propodeum.
 Polymorphic.

Etymology: named because of its golden girding.
 Synonym: *midas* Froggatt



Camponotus arenatus minor worker



Camponotus auocinctus major and minor worker

21 (19) Posterior section of mesonotum flat or nearly flat.....*wiederkehri*
21 (19) Posterior section of mesonotum convex anterior to metanotal groove..22 Page 54

22 (21) Propodeum with < 5 erect setae confined to near angle.....*donnellani*
22 (21) Propodeum with > 10 erect setae scattered along dorsum.....23 Page 56

Camponotus wiederkehri

Integument: glossy

Frontal carinae width: about 1/3 HW

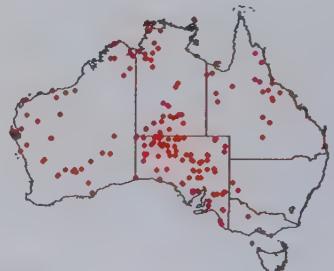
Erect setae under head: some J shaped

Erect setae tibiae: indistinct or flat

Erect setae mesosoma: > 10

Short setae on clypeus: fine

Head width: 1.2 - 3.6 mm, head length: 1.5 - 3.3 mm.



Posterior section of mesonotum flat (or nearly so) immediately anterior of metanotal groove; anterior section of mesonotum feebly convex, remainder joins with propodeal dorsum to form a long flat surface ending in a widely rounded angle; entire body clothed with fine flat-lying short setae.

Synonym: *denticulatus* Kirby; *latrunculus lucidor* Forel; *latrunculus* Wheeler.

Camponotus donnellani

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: some J shaped

Erect setae tibiae: indistinct or flat

Erect setae mesosoma: sparse

Short setae on clypeus: fine

Head width: 1.4 mm, head length: 1.6 mm.



Propodeum with at most 4 elongate erect setae near angle.



Camponotus wiederkehri major and minor worker



Camponotus donnellani minor worker

23 (22) Black head contrasting with reddish mesonotum, metanotal groove angular.....*rufonigrus*
 23 (22) Head and mesonotum same colour, metanotal groove weakly concave.....24 Page 56

24 (23) Scapes relatively short (in minors SL/HW < 1.5).....*ceriseipes*
 24 (23) Scapes relatively long (in minors SL/HW > 1.4).....*prosseri*

Camponotus rufonigrus

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: some J shaped

Erect setae tibiae: indistinct or flat

Erect setae mesosoma: > 30

Short setae on clypeus: plentiful

Head width: 1.1 - 1.4 mm, head length: 1.3 - 1.6 mm

Black head contrasting with red mesonotum.



Camponotus ceriseipes

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: some straight + J shaped

Erect setae tibiae: indistinct or flat

Erect setae mesosoma: > 10

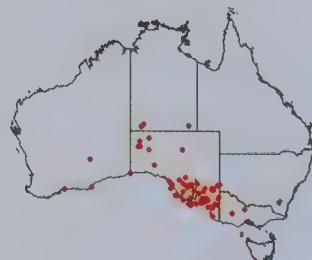
Short setae on clypeus: plentiful, not hiding integument

Metanotal groove: distinct

Node summit: not sharp

Vertex: strongly convex

Head width: 1.2 - 4.1 mm, head length: 1.4 - 3.4 mm



Head same colour as mesonotum (red to black); scapes relatively short in minors, ratio scape length/ head width < 1.5. Major worker. Anterior clypeal margin broadly convex across entire width, scarcely projecting. (This species can be confused with *prosseri*; larger minor workers of *ceriseipes* scape is relatively short.)

Etymology: French ceris = cherry, Latin pedes = foot, presumably referring to red legs

Camponotus prosseri

Similar to *ceriseipes* except in scape length of larger minor workers. In *ceriseipes*, ratio scape length / head width < 1.5; whereas in *prosseri*, ratio > 1.4.

Head width: 1 - 3.9 mm, head length: 1.5 - 3.2 mm.



Camponotus rufonigrus minor worker



Camponotus ceriseipes major and minor worker

26 (25) Node longer than high *leae*
 26 (25) Node higher than long *whitei*

Camponotus leae

Integument: coarsely punctate
 Frontal carinae width: about 1/3 HW
 Erect setae under head: absent
 Erect setae scape: raised to $> 30^\circ$
 Erect setae tibiae: raised to $> 30^\circ$
 Erect setae mesosoma: sparse
 Short setae on clypeus: present
 Head width: 1 - 2.9 mm, head length: 1.3 - 2.9 mm.
 Node: elongate, flat

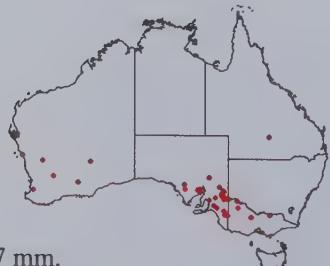


Etymology: named after A. M. Lea of the SA Museum.

A close relative of *Camponotus leae* has characters which differ from the type as follows:
 Erect setae under head: present
 Erect setae mesosoma: plentiful

Camponotus whitei

Integument: coarsely punctate
 Frontal carinae width: $> 1/3$ HW
 Erect setae under head: present
 Erect setae tibiae: raised to $> 30^\circ$
 Erect setae mesosoma: > 20
 Short setae on clypeus: not overlapping
 Head width: 1.4 - 2.7 mm, head length: 1.5 - 2.7 mm.
 Node: domed



Etymology: named after Captain S. A. White.
 Synonym: *scutellus* Clark.



Camponotus leae minor worker



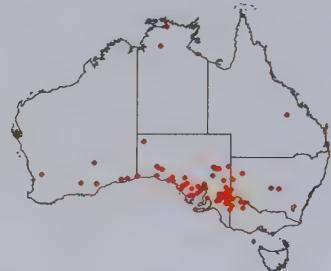
Camponotus whitei major and minor worker

28 (27) Mesosoma red, head black.....*armstrongi*
 28 (27) Otherwise.....29 Page 60

29 (28) Propodeum with long straight declivity at least 3 times longer than dorsum.....*triodiae*
 29 (28) Propodeum otherwise.....30 Page 62

Camponotus armstrongi

Integument: glossy
 Frontal carinae width: about 1/3 HW
 Erect setae under head: few
 Erect setae tibiae: raised to 5°
 Erect setae mesosoma: > 20 mostly long
 Short setae on clypeus: very sparse
 Head width: 1.2 - 2 mm, head length: 1.3 - 2 mm.



Major worker: Anterior clypeal margin projecting, median section concave, bounded by two teeth.

Minor worker: Anterior clypeal margin wide, projecting, convex.

Etymology: named after J. Armstrong.

Camponotus triodiae

Integument: side of head mostly smooth
 Frontal carinae width: < 1/3 HW
 Erect setae under head: < 5 long
 Erect setae tibiae: indistinct
 Setae scape: distinct raised to 30°
 Erect setae mesosoma: < 5 long mostly reddish
 Short setae on clypeus: very sparse
 Maximum head width: posterior to eye centres
 Ratio Propodeal declivity/dorssum: > 3



Jan Forrest, Paul Fennell and Peter Hudson collected specimens from Eyre Peninsula. It builds a distinctive tube like structure in clumps of spinifex, made from clay and carton.



Camponotus armstrongii major and minor worker



Camponotus triodiae major and minor worker

30 (29) Underside of head without erect setae.....	31 Page 62
30 (29) Underside of head with erect setae.....	37 Page 70
31 (30) Tibiae without setae raised >10°.....	32 Page 62
31 (30) Tibiae with setae raised >10°.....	35 Page 66
32 (31) Yellow.....	<i>gibbinotus</i>
32 (31) Otherwise.....	33 Page 62
33 (32) Punctate.....	<i>tristis</i>
33 (32) Not punctate.....	34 Page 64

Camponotus gibbinotus

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: absent, except for a few in depression near neck (not always visible).

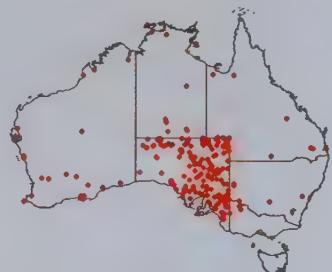
Erect setae tibiae: flat to < 5°

Erect setae mesosoma: < 5

Short setae on clypeus: absent

Yellowish, legs lighter.

Head width: 1.1 - 3.1 mm, head length: 1.5 - 3.05 mm.



Major worker. Anterior clypeal margin median section projecting nearly straight, bounded by angles.

Minor worker. Anterior clypeal margin median section projecting, convex.

Camponotus tristis

Integument: finely punctate

Frontal carinae width: < 1/3 HW

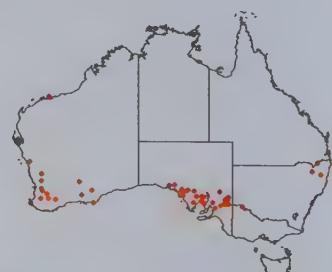
Erect setae under head: absent

Erect setae tibiae: indistinct

Erect setae mesosoma: < 4

Short setae on clypeus: very sparse

Head width: 1.7 - 3.2 mm, head length: 1.8 - 2.8 mm.



Major worker: anterior clypeal margin projecting, deeply concave in middle, bounded by teeth.

Minor worker: anterior clypeal margin projecting, crenulate in middle.



Camponotus gibbinotus major and minor worker



Camponotus tristis major and minor worker

34 (33) Frontal carinae wide ($> 1/3$ HW) head sides straight.....*claripes minimus*
 34 (33) Frontal carinae narrow ($< 1/4$ HW) head sides convex.....*oetkeri*

Camponotus claripes minimus

Integument: glossy

Frontal carinae width: $> 1/3$ HW

Erect setae under head: absent

Erect setae genae: absent

short setae tibiae: indistinct

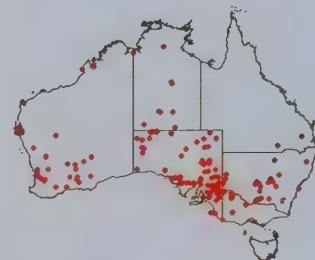
short setae scape: indistinct

Erect setae mesosoma: < 6

Short setae on clypeus: sparse

Head width: 0.95 - 2.44 mm, head length: 1.22 - 2.4 mm.

Brownish, legs lighter.



Major worker: anterior clypeal margin median third projecting, bounded by wide angles, crenulate between; metanotum distinct, depressed front and back, elevated between.

Minor worker: Anterior clypeal margin projecting, wide, convex. Large eyes. Head sides straight tapering to the front.

Camponotus oetkeri

Integument: glossy

Frontal carinae width: $< 1/3$ HW

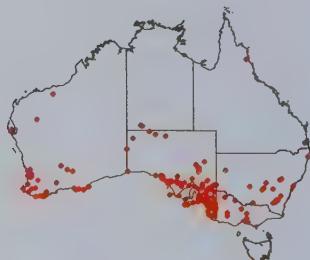
Erect setae under head: absent

Erect setae tibiae: flat

Erect setae mesosoma: absent

Short setae on clypeus: absent

Head width: 1.5 - 3.7 mm, head length: 1.7 - 3.45 mm.



Major worker: anterior clypeal margin projecting, median third concave.

Minor worker: anterior clypeal margin feebly projecting, median two thirds widely concave.



Camponotus claripes minimus major and minor worker



Camponotus oetkeri major and minor worker

35 (31) Eye length > 1/3 HW.....*woodroffeensis*
35 (31) Eye length < 1/3 HW.....36 Page 68

Camponotus woodroffeensis

Integument: glossy

Frontal carinae width: about 1/3 HW

Erect setae under head: very sparse

Erect setae tibiae: raised to about 10°

Erect setae mesosoma: about 5

Node: with sharp summit

Short setae on clypeus: not overlapping.

Head width: 0.8 - 1.8 mm, head length: 1 - 1.98 mm.

Anterior margin of clypeus: convex.

Reddish yellow.



Etymology: named after Mount Woodroffe where it was found by the late Rev. Bede Lowery SJ. in 1973.



Camponotus woodroffeensis major and minor worker

36 (35) Mesosoma black with > 10 erect setae.....*simpsoni*
 36 (35) Mesosoma black with < 10 erect setae.....*fraseri*

Camponotus simpsoni

Integument: glossy
 Frontal carinae width: > 1/3 HW
 Erect setae under head: absent
 Erect setae tibiae: raised to 45°
 Erect setae mesosoma: > 20
 Short setae on clypeus: very sparse
 Head width: 1.2 - 1.8 mm, head length: 1.2 - 1.8 mm.



Etymology: named after A. A. Simpson, a benefactor of the South Australian Museum.

Camponotus fraseri

Integument: glossy
 Frontal carinae width: > 1/3 HW
 Erect setae under head: absent
 Erect setae tibiae: > 30°
 Erect setae mesosoma: about 8
 Node: thin
 Short setae on clypeus: not overlapping
 Anterior margin of clypeus: convex.
 Head width: 0.93 mm, head length: 1.3 mm.

Dark red brown, legs lighter.

Etymology: named after Jack Fraser, a worker at Marino Conservation Park.





Camponotus simpsoni major and minor worker



Camponotus fraseri minor worker

37 (30) Finely punctate.....	<i>rudis</i>
37 (30) Not punctate.....	38 Page 70
38 (37) Scapes with setae raised above 40°.....	39 Page 70
38 (37) Scapes without setae raised above 40°.....	41 Page 74
39 (38) Yellowish.....	<i>andyyoungi</i>
39 (38) Black or dark brown.....	40 Page 72

Camponotus rufus

Integument: punctate

Frontal carinae width: < 1/3 HW

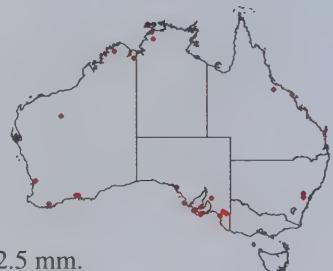
Erect setae under head: sparse

Erect setae tibiae: indistinct, flat

Erect setae mesosoma: > 5

Short setae on clypeus: not overlapping.

Head width: 1.2 - 2.25 mm, head length: 1.45 - 2.5 mm.



Major worker: anterior clypeal margin projecting, convex with a shallow concavity in middle.

Minor worker: anterior clypeal margin projecting, convex, crenulate in middle.

Etymology: so named because of the fine dense punctations, from Latin *rufus* = rough unpolished.

Camponotus andyyoungi

Integument: glossy

Frontal carinae width: about 1/3 HW

Erect setae under head: present

Erect setae tibiae: raised to 40°

Erect setae mesosoma: > 20

Node: thin

Short setae on clypeus: not overlapping

Anterior margin of clypeus: convex.

Head width: 1.2 - 1.4 mm, head length: 1.2 - 1.3 mm.



Yellowish.

Etymology: named after Andy Young, a prominent naturalist.



Camponotus rufidus minor worker



Camponotus andyyoungi major and minor worker

Separation of these two species (at present) requires the examination of major workers.

40 (39) Head of major worker with straight parallel sides.....*lownei*
40 (39) Head of major worker with convex sides.....*evae zeuxis*

Camponotus lownei

Integument: glossy

Frontal carinae width: > 1/3 HW

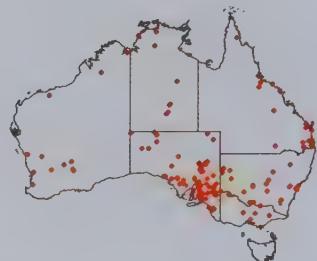
Erect setae under head: present

Erect setae tibiae: raised to > 45°

Erect setae mesosoma: > 30 long, short

Short setae on clypeus: sparse

Head width: 1.4 - 1.8 mm, head length: 1.2 - 2.1 mm.



Major worker: head sides mostly straight and parallel; anterior clypeal margin median third bounded by two pointed teeth, with a deep semicircular notch between.

Minor worker: anterior clypeal margin median third nearly straight, bounded by obtuse angles.

Camponotus evae zeuxis

Integument: glossy

Frontal carinae width: > 1/3 HW

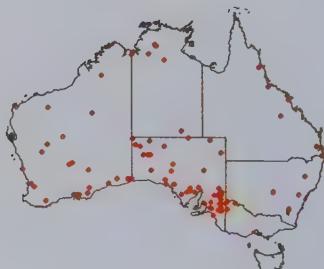
Erect setae under head: present

Erect setae tibiae: raised to > 45°

Erect setae mesosoma: > 30 long and short

Short setae on clypeus: sparse

Head width: 1.2 - 2.5 mm, head length: 1.4 - 2.6 mm.



Major worker: head sides mostly tapering to the front; anterior clypeal margin median third projecting, deeply concave in middle, bounded by two teeth.

Minor worker: anterior clypeal margin median two thirds projecting, evenly convex.



Camponotus lownei major and minor worker



Camponotus evae zeuxis major and minor worker

41 (37) Mesosoma mostly evenly convex, mostly black.....*arcuatus*
 41 (37) Mesosoma dorsum otherwise.....42 Page 74

42 (41) Small, overall < 6 mm; long head, HL > 1.5 HW.....*samueli*
 42 (41) Otherwise.....43 Page 76

Camponotus arcuatus

Integument: glossy

Frontal carinae width: > 1/3 HW

Erect setae under head: < 10

Erect setae tibiae: indistinct, flat

Erect setae mesosoma: > 10

Short setae on clypeus: not overlapping

Head width: 0.9 - 1.8 mm, head length: 1.1 - 1.7 mm.

In top view, PW (pronotal width) is = or > HW (head width).



Major worker: anterior clypeal margin concave between 2 teeth.

Minor worker: head width near pronotal width; anterior clypeal margin broadly convex with a weak central concavity; pronotum margined in front.

Etymology: presumably named because of the curvature of the mesosoma.

Camponotus samueli

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: present

Erect setae tibiae: raised to about 10°

Erect setae mesosoma: < 5

Node: with blunt summit

Short setae on clypeus: not overlapping.

Head width: 0.6 mm, head length: 0.87 mm.

Anterior margin of clypeus: convex.

Yellowish.



Etymology: named after John Samuel White, a naturalist.



Camponotus arcuatus major and minor worker



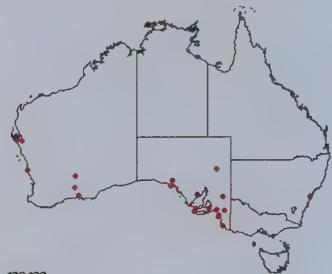
Camponotus samueli minor worker

43 (42) Head nearly square, HL < 1.1 HW.....*scratius*
43 (42) Otherwise.....44 Page 76

44 (43) Head sides straight, near parallel.....*claripes*
44 (43) Head sides feebly convex.....45 Page 78

Camponotus scratius

Integument: glossy
Frontal carinae width: about = 1/3 HW
Erect setae under head: few
Erect setae tibiae: raised to 10°
Erect setae mesosoma: < 10
Short setae on clypeus: not overlapping
Head width: 0.8 - 1.5 mm, head length: 1 - 1.6 mm.

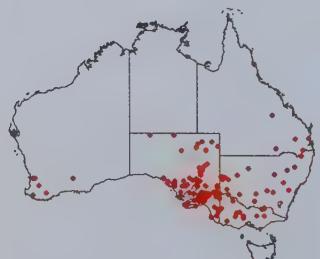


Major worker: anterior clypeal margin median section projecting, slightly convex, bounded by angles.

Minor worker: anterior clypeal margin median section projecting, straight, bounded by angles.

Camponotus claripes

Integument: glossy
Frontal carinae width: about 1/3 HW
Erect setae under head: few
Short setae tibiae: raised to 5°
Short setae scape: raised to 5°
Erect setae genae: present
Erect setae mesosoma: <10
Short setae on clypeus: not overlapping
Node summit: blunt
Propodeal angle: indistinct
Head width: 0.9 - 2.7 mm, head length: 1.5 - 2.85 mm.
Yellow brown to black, legs lighter.



Major worker: anterior clypeal margin median third projecting bounded by angles with a concavity between.

Minor worker: anterior clypeal margin median third projecting, convex, sometimes with a wide central concavity.



Camponotus scritius major and minor worker

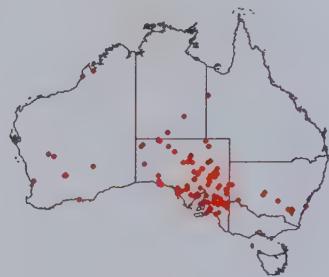


Camponotus claripes major and minor worker

45 (44) Yellowish.....*cowlei*
 45 (44) Mostly brownish.....*guidae*

Camponotus cowlei

Integument: glossy
 Frontal carinae width: < 1/3 HW
 Erect setae under head: few
 Short setae tibiae: raised to < 5°
 Short setae scape: raised to < 5°
 Erect setae mesosoma: < 6
 Erect setae genae: present
 Short setae on clypeus: not overlapping
 Propodeal angle: indistinct
 Head width: 1.3 - 3.5 mm, head length: 1.7 - 3.4 mm.
 Mostly yellow



Major worker: anterior clypeal margin median section projecting, nearly straight, bounded by angles. Minor worker: anterior clypeal margin median section projecting, convex.

Camponotus guidae

Integument: glossy
 Frontal carinae width: < 1/3 HW
 Erect setae under head: < 10
 Erect setae tibiae: distinct < 5°
 Erect setae mesosoma: < 5
 Short setae on clypeus: sparse
 Short setae on scapes: flat, indistinct
 Short setae on tibiae: flat-lying
 Anterior clypeal margin: median section projecting, flatly convex.
 Colour of legs: lighter than mesosoma.
 Propodeal angle: indistinct.
 Head width: 1.14 - 2.55 mm, head length: 1.45 - 2.73 mm.



Etymology: From Latin *guida* = guide. The ant was found at Douglas Scrub, the property of Guides South Australia.



Camponotus cowlei major and minor worker

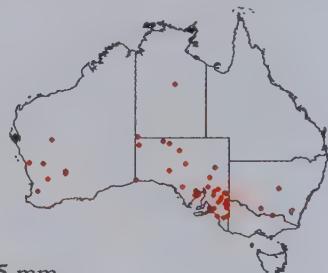


Camponotus guidae major and minor worker

46 (27) Small (< 6 mm long).....	47 Page 80
46 (27) Larger (> 6 mm long).....	48 Page 82
47 (46) Frontal carinae wide (> 1/3 HW).....	<i>sponsorum</i>
47 (46) Frontal carinae narrow (< 1/3 HW).....	<i>longifacies</i>

Camponotus sponsorum

Integument: glossy
Frontal carinae width: >1/3 HW
Erect setae under head: plentiful
Erect setae tibiae: indistinct, flat
Erect setae mesosoma: > 6
Short setae on clypeus: very sparse.
Head width: 0.85 - 2 mm, head length: 1.05 - 2.05 mm.



Major worker: anterior clypeal margin concave, bounded by two teeth.
Most of ant with fine short white non-overlapping flat-lying setae.
Small, yellow brown, sometimes mottled, gaster darker.

Camponotus longifacies

Integument: glossy
Frontal carinae width: < 1/3 HW
Erect setae under head: few
Erect setae tibiae: flat, fine,
Erect setae mesosoma: > 10
Short setae on clypeus: overlapping.
Head width: 1.2 - 1.7 mm, head length: 1 - 1.6 mm.
Major worker: clypeus mid section raised into a flattish plane above cheeks, anterior margin concave, bounded by two small teeth.
Small, combination of yellow and brown.



Etymology: named so because of the minor worker's high ratio of head length to head width.



Camponotus sponsorum major and minor worker



Camponotus longifacies major and minor worker

- 48 (46) Node longer than high.....49 Page 82
- 48 (46) Node higher than long.....52 Page 86

- 49 (48) Node anterior and posterior faces symmetrical.....50 Page 82
- 49 (48) Node anterior and posterior faces not symmetrical.....51 Page 84

- 50 (49) Mostly yellow.....*tricoloratus*
- 50 (49) Mostly red.....*rufus*

Camponotus tricoloratus

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: few to many

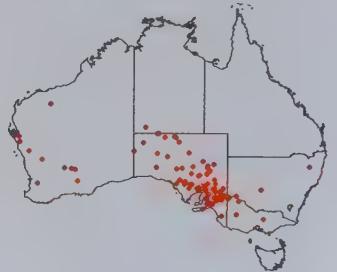
Erect setae tibiae: indistinct flat, short, not overlapping

Erect setae mesosoma: very sparse

Short setae on clypeus: not overlapping.

Head width: 1.9 - 5.1 mm, head length: 3.2 - 5 mm.

Major workers: overall length > 20 mm.



Camponotus rufus

Integument: glossy

Frontal carinae width: < 1/3 HW

Erect setae under head: absent

Erect setae tibiae: flat short not overlapping

Erect setae mesosoma: 1 or 2

Short setae on clypeus: not overlapping

Anterior clypeal margin: convex, crenulate, projecting.

Head width: 2 - 5.6 mm, head length: 3.1 - 5.1 mm.

Major workers: overall length > 20 mm.





Camponotus tricoloratus major and minor worker



Camponotus rufus major and minor worker

51 (49) Node anterior face concave.....*johnclarki*
 51 (49) Node anterior face not concave.....*stefani*

Camponotus johnclarki

Integument: glossy
 Frontal carinae width: < 1/3 HW
 Erect setae under head: present
 Erect setae tibiae: raised to > 10°
 Erect setae mesosoma: > 6
 Short setae on clypeus: not overlapping
 8 or 9 teeth.
 Head width: 1.8 mm, head length: 2.2 mm.



Etymology: named after John Clark, National Museum of Victoria.

Synonym: *Notostigma sanguinea* Clark.

Camponotus stefani

Integument: glossy, partly hidden by short setae
 Frontal carinae width: < 1/3 HW
 Erect setae under head: present
 Erect setae tibiae: indistinct, flat lying
 Erect setae mesosoma: sparse
 Short setae on clypeus: plentiful.
 Head width: 0.88 - 2.1 mm, head length: 1.4 - 2.3 mm.



Colour: combinations of black to red.

Biology: Nest is in soil with high clay content, entrance to nest is a small circular hole scarcely larger than major worker's head. Common in Adelaide parklands. Frequently seen foraging on trees in day time.

Etymology: Named after the late Stefan Schödl of Vienna in recognition of his contribution to myrmecology.



Camponotus johnclarki minor worker



Camponotus stefani major and minor worker

52 (48) Propodeal dorsum with short white curved setae just overlapping.....*scotti*
52 (48) Propodeal dorsum without short white curved setae.....53 Page 88

Camponotus scotti

Integument: glossy

Frontal carinae width: 1/3 HW

Erect setae under head: absent

Erect setae tibiae: < 5°

Erect setae mesosoma: < 10

Short setae on clypeus: not overlapping.

Head width: 1.2 - 2.4 mm, head length: 1.4 - 2.3 mm.



Short white curved setae distinct on mesosoma dorsum in lateral view.

Major worker: anterior clypeal margin feebly projecting with two teeth on either side of a shallow concavity; clypeus coarsely punctate.

Minor worker: anterior clypeal margin projecting, evenly convex.

Etymology: named in recognition of the Friends of Scott Creek Conservation Park where the type specimen was found by Tom Hands.



Camponotus scotti major and minor worker

53 (52) Mesosoma with plentiful erect short setae (length about half eye length)	54 Page 88
53 (52) Mesosoma without plentiful erect short setae (length about eye half length)	55 Page 90
54 (53) Gaster with fine golden pubescence hiding integument.....	<i>piliventris</i>	
54 (53) Gaster without fine golden pubescence hiding integument.....	<i>intrepidus</i>	

Camponotus piliventris

Integument: finely punctate
 Frontal carinae width: < 1/3 HW
 Erect setae under head: present
 Erect setae tibiae: raised to > 40°
 Erect setae mesosoma: > 50
 Short setae on clypeus: not overlapping
 Short setae on gaster: overlapping
 Head width: 1.6 - 3.5 mm, head length: 2.2 - 3.3 mm.



Camponotus intrepidus

Integument: finely punctate
 Frontal carinae width: < 1/3 HW
 Erect setae under head: present
 Erect setae tibiae: raised to > 40°
 Erect setae mesosoma: > 100
 Short setae on clypeus: not overlapping
 Short setae on gaster: not overlapping
 Head width: 2.3 - 4.6 mm, head length: 2.9 - 4.5 mm.



Synonyms: *agilis* Smith; *magnus* Mayr.



Camponotus piliventris major and minor worker



Camponotus intrepidus major and minor worker

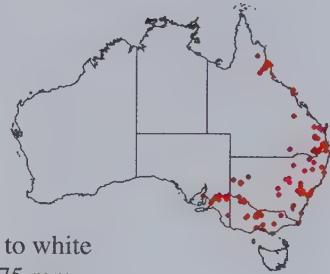
55 (53) Gaster with fine pubescence, propodeal dorsum not concave..56 Page 90
 55 (53) Gaster without fine pubescence, propodeum concave.....57 Page 92

56 (55) Underside of head without erect setae.....*aeneopilosus*
 56 (55) Underside of head with erect setae.....*nigroaeneus divus*

Camponotus aeneopilosus

Integument: finely punctate
 Frontal carinae width: about 1/3 HW
 Erect setae under head: absent
 Erect setae tibiae: not overlapping, flat
 Erect setae mesosoma: < 10
 Short setae on gaster: fine, overlapping, yellow to white
 Head width: 1.3 - 2.8 mm, head length: 1.5 - 1.75 mm.

Etymology: aeneo = yellow, pilose = hairy.



Camponotus nigroaeneus divus

Integument: glossy
 Frontal carinae width: > 1/3 HW
 Erect setae under head: few
 Erect setae tibiae: raised to < 5°
 Erect setae mesosoma: < 10
 Short setae on gaster: fine, scarcely overlapping, whitish.



Head width: 1.1 - 2.4 mm, head length: 1.4 - 2.5 mm.

Although not yet recorded from South Australia, it is likely that this ant will be found here.



Camponotus aeneopilosus major and minor worker



Camponotus nigroaeneus divus major and minor worker

57 (55) Clypeus with overlapping setae hiding integument.....58 Page 92
 57 (55) Clypeus without overlapping setae hiding integument.....59 Page 94

58 (57) Mesosoma with < 20 erect long setae.....*fergusoni*
 58 (57) Mesosoma with > 20 erect long setae.....*pawseyi*

Camponotus fergusoni

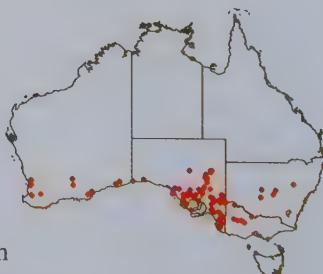
Integument: partly hidden by short setae
 Propodeum: concave
 Frontal carinae width: < 1/3 HW
 Erect setae under head: none or sparse
 Erect setae tibiae: indistinct or flat
 Erect setae on genae: few
 Erect setae mesosoma: few
 Head sides: straight, tapering to front
 Short setae on clypeus: hiding integument.



Etymology: named after Ferguson Conservation Park from where it was collected by G. Weber.

Camponotus pawseyi

Integument: partly hidden by short setae
 Frontal carinae width: about 1/3 HW
 Erect setae under head: present
 Erect setae tibiae: raised to > 10°
 Erect setae mesosoma: > 50
 Short setae on clypeus: overlapping.
 Head width: 1.5 - 3 mm, head length: 1.6 - 3 mm



Colour of propodeum variable (black to red).

Etymology: named after the late C. K. Pawsey, a prominent naturalist.



Camponotus fergusoni major and minor worker



Camponotus pawseyi major and minor worker

59(57) Finely punctate.....	60 Page 94
59(57) Otherwise.....	62 Page 98
60 (59) Propodeum strongly concave.....	<i>chalceus</i>
60 (59) Propodeum near straight.....	61 Page 96

Camponotus chalceus

Integument: finely punctate
 Frontal carinae width: > 1/3 HW
 Erect setae under head: present
 Erect setae genae: present
 Erect setae tibiae: indistinct or flat
 Erect setae mesosoma: > 10
 Flat lying setae on clypeus: sparse.
 Vertex: convex
 Head sides: convex
 Head width: 1.5 - 2.4 mm, head length: 1.7 - 2.35 mm.

Propodeum red or black.





Camponotus chalceus major and minor worker

61 (60) Mesosoma posterior in side view, without short flat lying setae.....*innexus*
61 (60) Mesosoma posterior in side view, with short flat lying setae*hartogi*

Camponotus innexus

Integument: finely punctate
Frontal carinae width: > 1/3 HW
Erect setae under head: present
Erect setae tibiae: indistinct or flat
Erect setae mesosoma: < 15
Short setae on clypeus: absent



Head width: 1.3 - 2.1 mm, head length: 1.6 - 2.2 mm.

Without fine flat-lying setae (pubescence)

Camponotus hartogi

Integument: finely punctate
Frontal carinae width: > 1/3 HW
Erect setae under head: present
Erect setae tibiae: indistinct or flat
Erect setae mesosoma: < 15
Short setae on clypeus: sparse



With some fine flat-lying setae (pubescence)

Synonym: *ferruginipes* Crawley

**Camponotus hartogi* and *Camponotus innexus* are hard to separate and may be synonyms.



Camponotus innexus major and minor worker



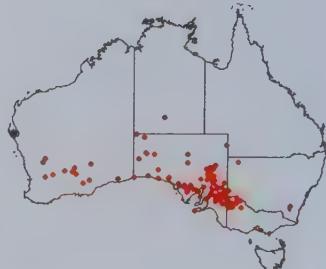
Camponotus hartogi major and minor worker

62 (59) Underside of head without long erect setae.....63 Page 98
 62 (59) Underside of head with some long erect setae.....64 Page 100

63 (62) Mostly black.....*cinereus amperei*
 63 (62) Mostly red brown.....*christmasensis*

Camponotus cinereus amperei

Integument: finely striate, glossy
 Frontal carinae width: about 1/3 HW
 Erect setae under head: absent
 Erect setae tibiae: indistinct, flat
 Erect setae: mesosoma <10
 Short setae on clypeus: not hiding integument.
 Mandibles: black, red teeth.
 Node summit: convex
 Head width: 1.3 - 2.2 mm, head length: 1.4 - 2.25 mm.



Major worker: anterior clypeal margin median section feebly concave.
 Minor worker: anterior clypeal margin median section feebly convex crenulate.
 Mostly black.

Camponotus christmasensis

Integument: glossy
 Frontal carinae width: 1/3 HW
 Erect setae under head: absent
 Erect setae tibiae: indistinct
 Erect setae mesosoma: about 6
 Node: sides parallel
 Short setae on clypeus: not overlapping
 Anterior margin of clypeus: straight, crenulate.
 Head width: 1.3 - 2.57 mm, head length: 1.54 - 2.46 mm.



Red-brown, legs lighter.

Etymology: named after Christmas Rocks where it was found.



Camponotus cinereus amperei major and minor worker



Camponotus christmasensis major and minor worker

64 (62) Clypeus anterior margin near straight wide with square corners...*spenceri*
64 (62) Otherwise.....65 Page 100

65 (64) Head wider at mandibles than at vertex*palkura*
65 (64) Head otherwise.....66 Page 102

Camponotus spenceri

Integument: finely punctate
Frontal carinae width: about 1/3 HW
Erect setae under head: short > 20
Erect setae tibiae: raised to > 40°
Erect setae mesosoma: > 6
Short setae on clypeus: sparse.
Head width: 1.4 - 2.5 mm, head length: 1.8 - 2.7 mm.



Major worker: anterior clypeal margin median section bounded by square corners with a wide very shallow concavity between.

Minor worker: anterior clypeal margin median section bounded by rounded corners, straight between.

Etymology: named after Baldwin Spencer, the leader of the Horn Scientific Expedition to Central Australia 1894.

Synonym: *reticulatus* Kirby.

Camponotus palkura

Integument: glossy
Frontal carinae width: < 1/3 HW
Erect setae under head: plentiful
Erect setae tibiae: indistinct
Erect setae mesosoma: > 50
Short setae on clypeus: sparse
Clypeus anterior margin: convex
Setae on scape: raised to about 5°.
Head width: 1.5 - 3.5 mm, head length: 2.2 - 3.6 mm.
All yellow.
Dimorphic.



Etymology: named from the word palkura = yellowish in the Pangkala Aboriginal language of Eyre Peninsula, South Australia.



Camponotus spenceri major and minor worker

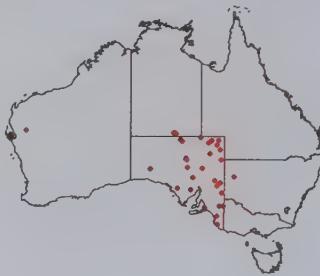


Camponotus palkura major and minor worker

66 (65) Mesosoma with < 10 erect setae.....	67 Page 102
66 (65) Mesosoma with > 10 erect setae.....	68 Page 104
67 (66) Head yellowish.....	<i>churchetti</i>
67 (66) Head black or dark brown.....	<i>claripes elegans</i>

Camponotus churchetti

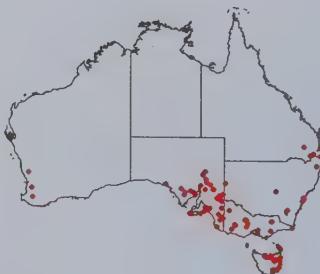
Integument: glossy
 Frontal carinae width: < 1/3 HW
 Erect setae under head: present
 Erect setae tibiae: indistinct
 Erect setae mesosoma: < 6
 Node: thick
 Short setae on clypeus: not overlapping
 Anterior margin of clypeus: convex.
 Head width: 0.96 - 2.94 mm, head length: 1.38 - 2.9 mm.
 Yellowish.



Etymology: named after Graham Churchett, a prominent naturalist.

Camponotus claripes elegans

Integument: glossy
 Frontal carinae width: > 1/3 HW
 Erect setae under head: few
 Erect setae tibiae: raised to 10°
 Erect setae mesosoma: < 10
 Short setae on clypeus: not overlapping.
 Short setae on gena: few
 Propodeal dorsum: mostly straight
 Head width: 1 - 2.5 mm, head length: 1.65 - 2.7 mm.



Major worker: anterior clypeal margin median section narrow, deeply concave.
 Minor worker: anterior clypeal margin median section widely concave; head thin in lateral view.



Camponotus churchetti major and minor worker



Camponotus claripes elegans major and minor worker

68 (66) Head and mesosoma red..... *judithmorrisae*
68 (66) Head and mesosoma not all red..... 69 Page 106

Camponotus judithmorrisae

Integument: glossy
Frontal carinae width: about 1/3 HW
Erect setae under head: present
Erect setae tibiae: indistinct
Erect setae mesosoma: > 20
Node: convex summit.
Short setae on clypeus: not overlapping
Anterior margin of clypeus: convex, crenulate.
Head width: 1.4 - 3.1 mm, head length: 1.75 - 3.06 mm.
Mostly red.



Etymology: named after Mrs Judith Morris, a benefactor of the South Australian Museum.



Camponotus judithmorrisae major and minor worker

69 (68) Head sides strongly tapering to the front.....*philwardi*
 69 (68) Head sides otherwise*malleensis*

Camponotus philwardi

Integument: glossy

Frontal carinae width: about 1/3 HW

Erect setae under head: present

Erect setae tibiae: indistinct

Erect setae mesosoma: > 10

Node: convex summit

Short setae on clypeus: not overlapping

Anterior margin of clypeus: concave.

Head width: 1.3 - 2.38 mm, head length: 1.4 - 2.29 mm.

Mesosoma and limbs yellowish, otherwise reddish..

Etymology: named after Phil Ward, a prominent myrmecologist.



Camponotus malleensis

Integument: glossy

Frontal carinae width: > 1/3 HW

Erect setae under head: plentiful

Erect setae tibiae: indistinct

Erect setae mesosoma: > 50

Short setae on clypeus: sparse

Clypeus anterior margin: notched

Setae on scape: raised to about 5°.

Head width: 1.1 - 2.4 mm, head length: 1.68 - 2.47 mm.

Dimorphic.

Etymology: Named after Mallee the name of a growth form of Eucalyptus (Myrtaceae) the ant's habitat.





Camponotus philwardi major and minor worker



Camponotus malleensis major and minor worker

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APPENDIX 1

COUPLETS (CONSOLIDATED)

1 Fore femurs about double the thickness of other femurs	2
1 Femurs all about same thickness	3
2 (1) Propodeal dorsum convex	<i>gasseri</i>
2 (1) Propodeal dorsum near straight	<i>macrocephalus</i>
3 (1) Anterior clypeus concave, projecting, corners sharp	4
3 (1) Anterior clypeus otherwise	7
4 (3) Underside of head with erect setae	5
4 (3) Underside of head without erect setae	6
5 (4) Head yellow	<i>clarior</i>
5 (4) Head brown or black	<i>nigriceps</i>
6 (4) Anterior gaster lighter than posterior	<i>consobrinus</i>
6 (4) Anterior gaster not lighter than posterior	<i>loweryi</i>
7 (3) Top of eyes within half eye length from corners, head sides straight, vertex flattish	8
7 (3) Eyes or head sides otherwise	14
8 (7) All red	<i>afflatus</i>
8 (7) Not all red	9
9 (8) Scapes with plentiful erect short setae	<i>tasmani</i>
9 (8) Scapes without erect short setae	10
10 (9) Without erect setae on underside of head	11
10 (9) With erect setae on underside of head	12
11 (10) Propodeum concave	<i>capito</i>
11 (10) Propodeum not concave, mostly black	<i>pitjantjatare</i>
12 (10) Propodeum concave, mesosoma elongate	13
12 (10) Propodeum not concave, mesosoma squat	<i>inflatus</i>
13 (12) Tibiae with short setae raised to 30°	<i>ephippium</i>
13 (12) Tibiae without raised up short setae	<i>capito ebini thorax</i>
14 (7) Iridescent, neck attached to head well below vertex	<i>perjurus</i>
14 (7) Neck attached to head near vertex	15

15 (14) With a few J shape setae on underside of head	16
15 (14) Without J shape setae on underside of head	25
16 (15) Scape with distinct erect short setae	17
16 (15) Scape without distinct erect short setae	18
17 (16) Summit of node convex	<i>gouldianus</i>
17 (16) Summit of node angular, gaster not hidden by pubescence	<i>terebrans</i>
18 (16) Entirely black, plentiful long erect setae, plentiful flat-lying short setae	<i>owensae</i>
18 (16) Not all black, with a few scattered long erect setae	19
19 (18) Metanotal groove depressed below the level of the anterior propodeum	20
19 (18) Metanotal groove indistinct or angular	21
20 (19) Mesosonotum and propodeum yellowish	<i>arenatus</i>
20 (19) Propodeum reddish	<i>aurocinctus</i>
21 (19) Posterior section of mesonotum flat or nearly flat	<i>wiederkehri</i>
21 (19) Posterior section of mesonotum convex anterior to metanotal groove	22
22 (21) Propodeum with < 5 erect setae confined to near angle	<i>donnellani</i>
22 (21) Propodeum with > 10 erect setae scattered along dorsum	23
23 (22) Black head contrasting with reddish mesonotum, metanotal groove angular	<i>rufonigrus</i>
23 (22) Head and mesonotum same colour, metanotal groove weakly concave	24
24 (23) Scapes relatively short (in minors SL/HW < 1.5)	<i>ceriseipes</i>
24 (23) Scapes relatively long (in minors SL/HW > 1.4)	<i>prosseri</i>
25 (15) Coarsely punctate	26
25 (15) Not coarsely punctate	27
26 (25) Node longer than high	<i>leae</i>
26 (25) Node higher than long	<i>whitei</i>
27 (25) Mesosoma squat (L < 2H)	28
27 (25) Mesosoma elongate (L > 2H)	46

28 (27) Mesosoma red, head black	<i>armstrongi</i>
28 (27) Otherwise	29
29 (28) Propodeum with long straight declivity at least 3 times longer than dorsum	<i>triodiae</i>
29 (28) Propodeum otherwise	30
30 (29) Underside of head (excluding depression surrounding neck) without erect setae	31
30 (29) Underside of head with erect setae	37
31 (30) Scape without setae raised > 40°	32
31 (30) Scape with setae raised > 40°	35
32 (31) Yellow	<i>gibbinotus</i>
32 (31) Otherwise	33
33 (32) Punctate	<i>tristis</i>
33 (32) Not punctate	34
34 (33) Frontal carinae wide (> 1/3 HW) head sides straight	<i>claripes minimus</i>
34 (33) Frontal carinae narrow (< 1/4 HW) head sides convex	<i>oetkeri</i>
35 (31) Eye length > 1/3 HW	<i>woodroffeensis</i>
35 (31) Eye length < 1/3 HW	36
36 (35) Mesosoma black or brown with > 10 erect setae	<i>simpsoni</i>
36 (35) Mesosoma black or brown with < 10 erect setae	<i>fraseri</i>
37 (30) Finely punctate	<i>rudis</i>
37 (30) Not punctate	38
38 (37) Scapes with setae raised above 40°	39
38 (37) Scapes without setae raised above 40°	41
39 (38) Yellowish	<i>andyyoungi</i>
39 (38) Black or dark brown	40
40 (39) Head of major worker with straight parallel sides	<i>lownei</i>
40 (39) Head of major worker with convex sides	<i>evae zeuxis</i>
41 (37) Mesosoma mostly evenly convex, mostly black	<i>arcuatus</i>
41 (37) Mesosoma dorsum otherwise	42

42 (41) Small, overall < 6 mm; long head, HL > 1.5 HW	<i>samueli</i>
42 (41) Otherwise	43
43 (42) Head nearly square, HL < 1.1 HW	<i>scratus</i>
43 (42) Otherwise	44
44 (43) Head sides straight, near parallel	<i>claripes</i>
44 (43) Head sides feebly convex	45
45 (44) Yellowish	<i>cowlei</i>
45 (44) Mostly brownish	<i>guidae</i>
46 (27) Small (< 6 mm long)	47
46 (27) Larger (> 6 mm long)	48
47 (46) Frontal carinae wide (> 1/3 HW)	<i>sponsorum</i>
47 (46) Frontal carinae narrow (< 1/3 HW)	<i>longifacies</i>
48 (46) Node longer than high	49
48 (46) Node higher than long	52
49 (48) Node anterior prosterior faces symetrical	50
49 (48) Node anterior prosterior faces not symmetrical	51
50 (49) Mostly yellow	<i>tricoloratus</i>
50 (49) Mostly red	<i>rufus</i>
51 (49) Node anterior face concave	<i>johnclarki</i>
51 (49) Node anterior face not concave	<i>stefani</i>
52 (48) Propodeal dorsum with short white curved setae just overlapping	<i>scotti</i>
52 (48) Propodeal dorsum without short white curved setae	53
53 (52) Mesosoma with plentiful erect short setae (length about half eye length)	54
53 (52) Mesosoma without plentiful erect short setae (length about half eye length)	55
54 (53) Gaster with fine golden pubescence hiding integument	<i>piliventris</i>
54 (53) Gaster without fine golden pubescence hiding integument	<i>intrepidus</i>
55 (53) Gaster with fine pubescence, propodeal dorsum not concave	56
55 (53) Gaster without fine pubescence, propodeum concave	57

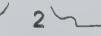
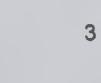
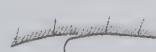
56 (55) Underside of head without erect setae	<i>aeneopilosus</i>
56 (55) Underside of head with erect setae	<i>nigroaeneus divus</i>
57 (55) Clypeus with overlapping setae hiding integument	58
57 (55) Clypeus without overlapping setae hiding integument	59
58 (57) Mesosoma with < 20 erect long setae	<i>fergusoni</i>
58 (57) Mesosoma with > 20 erect long setae	<i>pawseyi</i>
59 (57) Finely punctate	60
59 (57) Otherwise	62
60 (59) Propodeum strongly concave	<i>chalceus</i>
60 (59) Propodeum near straight	61
61 (60) Posterior mesosoma in side view, without short flatlying setae	<i>innexus</i>
61 (60) Posterior mesosoma in side view, with short flatlying setae	<i>hartogi</i>
62 (59) Underside of head without long erect setae	63
62 (59) Underside of head with some long erect setae	64
63 (62) Mostly black	<i>cinereus amperei</i>
63 (62) Mostly red brown	<i>christmasensis</i>
64 (62) Clypeus anterior margin near straight wide with square corners	<i>spenceri</i>
64 (62) Otherwise	65
65 (64) Head wider at mandibles than at vertex	<i>palkura</i>
65 (64) Head otherwise	66
66 (65) Mesosoma with < 10 erect setae	67
66 (65) Mesosoma with > 10 erect setae	68
67 (66) Head yellowish	<i>churchetti</i>
67 (66) Head black or dark brown	<i>claripes elegans</i>
68 (66) Head and mesosoma red	<i>judithmorrisae</i>
68 (66) Head and mesosoma not red	69
69 (68) Head sides strongly tapering to the front	<i>philwardi</i>
69 (68) Head sides otherwise	<i>malleensis</i>

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	integument	head sides	head sides taper	vertex	clypeus	frontal carinae width	mesosoma dorsum	node summit	setae under head	setae tibiae	setae scape	mesosoma setae	setae length	setae distribution	setac on gaster	gena setae
<i>aeneopilosus</i>	1	2	2	1	3	3.5	3	2	1	1	1	2	2	1	1	0
<i>afflatus</i>	1	2	2	2	4	3.5	1	2	1	1	1	1	2	2	2	0
<i>andyyoungi</i>	1	1	2	1	4	3.3	3	1	3	3	3	2	2	1	2	0
<i>arcuatus</i>	1	2	2	1	5	3.3	4	2	3	1	1	2	2	2	2	1
<i>arenatus</i>	1	2	1	2	4	2.3	1	2	2	1	1	3	2	1	2	1
<i>armstrongi</i>	1	2	2	1	4	2.5	4	1	3	2	2	3	2	1	2	0
<i>aurocinctus</i>	1	2	1	2	4	3.5	1	4	4	1	1	1	2	1	2	0
<i>capito</i>	1	1	1	2	4	2.4	1	2	1	1	1	1	2	1	2	0
<i>capito ebinithorax</i>	1	2	1	1	4	2.4	1	2	3	1	1	1	2	1	2	0
<i>ceriseipes</i>	1	1	2	2	4	3.6	1	4	4	1	1	2	2	1	2	1
<i>chalceus</i>	2	1	2	2	4	2.8	2	2	3	1	1	2	2	1	2	1
<i>christmasensis</i>	1	2	2	1	4	2.5	3	2	1	1	1	2	2	1	2	0
<i>churchetti</i>	1	2	1	1	4	3.3	3	2	3	1	1	1	2	2	2	1
<i>cinereus amperei</i>	1	2	1	1	4	2.8	3	2	1	1	1	2	2	1	2	0
<i>clarior</i>	1	1	1	1	1	3.4	3	2	3	2	2	3	3	1	2	1
<i>claripes</i>	1	2	1	1	4	2.9	3	2	3	2	2	2	2	1	2	1
<i>claripes elegans</i>	1	2	1	1	4	2.9	3	2	3	2	1	2	2	1	2	1
<i>claripes minimus</i>	1	2	2	1	4	2.5	3	2	1	1	1	1	2	1	2	0
<i>consobrinus</i>	1	1	1	1	2	3.3	3	2	1	2	2	2	2	1	2	0
<i>cowlei</i>	1	2	1	2	3	3.6	4	2	3	2	2	2	2	1	2	1
<i>donnellani</i>	1	2	1	2	4	3.4	1	2	4	1	1	2	2	1	2	1
<i>ephippium</i>	4	2	1	1	4	3.3	1	2	3	2	1	3	2	1	1	1
<i>evae zeuxis</i>	1	1	2	1	4	2.8	3	2	3	3	3	3	2	1	2	1
<i>fergusoni</i>	4	2	1	1	4	3.8	1	2	3	1	1	2	2	1	1	1
<i>fraseri</i>	1	2	2	2	4	3.2	3	2	1	3	3	1	2	1	2	0
<i>gasseri</i>	1	1	1	2	4	1.5	1	2	1	1	1	1		0	0	0
<i>gibbinotus</i>	1	2	1	1	4	3.6	3	2	1	1	1	1	2	1	2	0
<i>gouldianus</i>	4	1	1	2	4	3.4	3	2	4	3	3	3	1	1	1	1
<i>guidae</i>	1	1	2	1	3	3.3	3	2	3	1	1	1	2	1	2	1
<i>hartogi</i>	2	1	2	1	5	2.3	2	2	3	1	4	3	2	1	2	1
<i>inflatus</i>	2	1	2	1	4	3.2	3	2	3	2	1	3	2	1	2	1
<i>innexus</i>	2	1	2	1	5	2.3	2	2	3	1	4	3	2	1	2	1
<i>intrepidus</i>	2	1	2	2	4	3.7	1	2	3	3	3	3	1	1	2	1
<i>johnclarki</i>	1	2	1	3	4	4.2	1	5	3	3	3	3	1	1	2	1

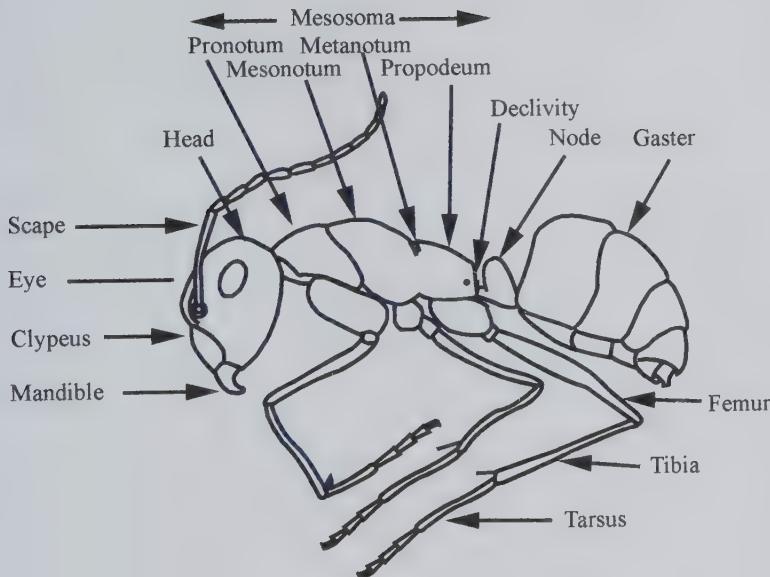
	A	B	C	D	E	F	G	H	I	J	K	L	N	M	O	P
	integument	head sides	head sides taper	vertex	clypeus	frontal carinae width	mesosoma dorsum	node summit	setae under head	setae tibiae	setae scape	mesosoma setae	setae length	setae distribution	setae on gaster	gena setae
<i>judithmorrisae</i>	1	2	1	2	4	3.0	3	2	3	1	1	3	2	1	2	1
<i>leae</i>	3	2	2	2	6	2.9	1	4	1	3	3	2	2	1	1	1
<i>longifacies</i>	4	2	2	2	4	3.3	1	2	3	1	1	2	2	1	1	0
<i>loweryi</i>	1	2	1	1	2	3.2	3	2	1	1	1	3	2	3	2	0
<i>lownei</i>	1	1	2	1	4	3.3	3	2	3	3	3	3	2	1	2	1
<i>macrocephalus</i>	1	1	1	2	4	2.1	3	2	1	1	1	1	2	0		
<i>malleensis</i>	1	1	2	1	5	2.5	3	2	3	2	2	3	2	1	2	1
<i>nigriceps</i>	1	2	1	2	2	3.2	3	2	3	2	2	3	2	1	2	1
<i>nigroaeneus divus</i>	1	2	1	2	5	2.9	3	2	3	2	2	2	2	1	3	W
<i>oetkeri</i>	1	1	2	1	4	3.7	3	1	1	1	1	1	2	0		
<i>owensae</i>	4	2	1	1	4	3.2	1	3	4	3	2	3	3	1	2	1
<i>palkura</i>	1	2	3	1	4	2.8	3	2	3	1	1	3	2	1	2	0
<i>pawseyi</i>	4	2	2	2	4	3.0	1	2	3	2	2	3	2	1	1	1
<i>perjurus</i>	1	2	2	2	4	2.8	1	2	1	1	1	3	2	1	2	0
<i>philwardi</i>	2	1	2	2	5	2.8	3	2	3	1	2	3	2	3	2	1
<i>piliventris</i>	2	1	2	1	4	4.0	1	2	3	3	3	3	1	1	1	1
<i>pitjantjatarae</i>	2	2	2	1	4	2.8	3	2	1	1	1	2	2	1	2	0
<i>prosseri</i>	1	1	2	2	4	3.6	1	4	4	1	1	2	2	1	2	1
<i>rudis</i>	2	1	1	2	4	3.3	3	2	3	1	1	2	2	1	2	1
<i>rufonigrus</i>	1	1	1	2	4	3.3	1	2	2	1	1	1	2	3	1	1
<i>rufus</i>	1	2	3	3	3	4.2	3	3	1	1	1	1	1	2	2	0
<i>samueli</i>	1	2	2	2	4	2.6	3	2	3	2	2	1	2	2	2	1
<i>scotti</i>	1	2	2	1	4	3.0	3	2	1	1	1	2	2	1	2	0
<i>scratius</i>	1	2	2	1	4	2.8	3	2	3	1	1	1	2	1	2	1
<i>simpsoni</i>	1	2	2	2	4	3.0	3	1	1	3	3	1	2	1	2	0
<i>spenceri</i>	2	1	1	1	3	3.0	3	2	3	3	3	2	2	3	2	1
<i>sponsorum</i>	1	2	2	2	4	2.8	1	2	3	1	1	2	2	1	2	0
<i>stefani</i>	4	2	2	1	4	3.4	3	3	3	1	1	1	2	1	2	0
<i>tasmani</i>	4	2	1	1	4	3.1	1	2	3	3	3	3	2	1	2	1
<i>terebrans</i>	1	1	1	2	4	3.3	3	2	4	3	3	2	2	1	2	0
<i>tricoloratus</i>	2	1	1	2	4	3.3	3	2	1	1	1	2	2	1	2	1
<i>triodiae</i>	1	2	2	1	6	3.3	3	2	3	1	3	1	2	3	2	0
<i>tristis</i>	1	1	2	2	5	3.5	3	1	1	1	1	1	2	1	2	0
<i>whitei</i>	3	1	2	1	4	3.1	1	2	3	3	3	2	2	1	2	1
<i>wiederkehri</i>	4	1	1	2	4	3.3	3	2	4	1	1	2	2	1	1	1
<i>woodroffeensis</i>	1	1	2	2	4	3.0	3	2	1	2	2	1	2	1	2	0

APPENDIX 2

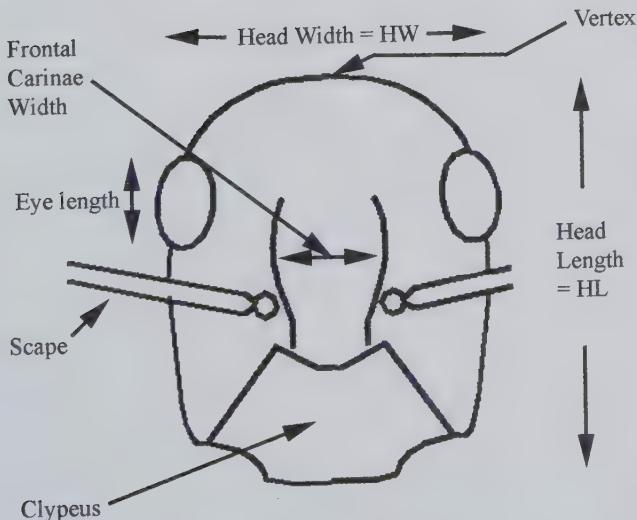
LEGEND OF CHARACTERS

A head: Integument	1 glossy, 2 reticulate, 3 coarsly punctate 4 hidden or partially hidden by setae.
B head sides: curvature	1 (), 2 , 3 / \,
C head sides : taper	1 , 2 \ /, 3 / \,
D head: vertex	1  2  3 
E head: clypeus	1  2  3  4 
F ratio HW/FCW	HW  FCW 
G dorsum:	1  2  3  4  5  6 
H node: summit	1  2  3  4  5  6 
I setae: under head	1  2  3  4 
J setae: tibiac	1  2  3  4 
K setae: scape	1  2  3  4 
L setae: mesosoma, no.	1 = < 6, 2 = 6 to 20, 3 = > 20
M setae: mesosoma, length	1  2 
N setae: mesosoma, distribution	1  2  3 
O setae: on gaster, short	1  2 
P setae: on sides of head above mandibles	1  0 

Angle	In side view, between dorsum and declivity of propodeum.
Anterior clypeal margin	Portion of clypeus covering mandibles.
Carton	Chewed vegetable material mixed with soil
Caste	Queen, male, major, medium or minor worker.
Clypeus	One of the plates forming the anterior head, shield shaped.
Crenulate	Indented.
Declivity	Posterior of mesosoma.
Dimorphic	Species lacks medium workers.
Dorsum	Upper surface.
Femur	Segment of leg above tibia.
Frontal carinae	A pair of long ridges in centre of head in front view.
Gaster	Posterior section.
Genae	Cheeks.
Integument	Outer surface.
Iridescent	Reflecting coloured light.
Mandibles	Jaws.
Mesonotum	Second segment of mesosoma.
Metanotal Groove	Groove between mesonotum and propodeum. Often obsolete.
Node	Segment between mesosoma and gaster. Situated on petiole.
Ocelli	Eyes situated on forehead. Only in some castes.
Polymorphic	Species with workers of varying sizes.
Pronotum	Front section of mesosoma.
Propodeum	Posterior section of mesosoma.
Pubescence	Fine flat-lying short setae.
Punctate	Indented.
Scape	Elongate base segment of antenna.
Setae	Hair.
Spiracle	An orifice of the breathing system through which gases pass.
Tibiae	Segment of leg below femur.
Truncate	Abrupt.
Vertex	Top of head.



LATERAL VIEW



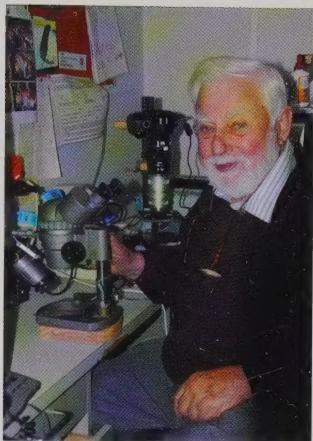
FRONT VIEW OF HEAD

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<i>Camponotus aeneopilosus</i> Mayr, 1862 (NHW)	90
<i>Camponotus afflatus</i> Viehmeyer, 1925 (ZMB)	38
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<i>Camponotus arcuatus</i> Mayr, 1876 (NHW)	74
<i>Camponotus arenatus</i> Shattuck & McArthur, 2002 (ANIC)	52
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<i>Camponotus aurocinctus</i> Smith, 1858 (BMNH)	52
<i>Camponotus capito</i> Mayr, 1876 (NHW)	40
<i>Camponotus capito ebini thorax</i> Forel, 1915 (MHNG)	44
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<i>Camponotus donnellani</i> Shattuck & McArthur, 2002 (ANIC)	54
<i>Camponotus ephippium</i> Smith, 1858 (BMNH)	44
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<i>Camponotus longifacies</i> McArthur, 2003 (ANIC)	80
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<i>Camponotus terebrans</i> Lowne, 1865 (BMNH)	48
<i>Camponotus tricoloratus</i> Clark, 1941 (NMV)	82
<i>Camponotus triodiae</i> McArthur, 2009 (SAMA)	60
<i>Camponotus tristis</i> Clark, 1930 (NMV)	62
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LOCATIONS OF TYPE MATERIAL

AMS = Australian Museum, Sydney, Australia; ANIC = Australian National Insect Collection, Canberra, Australia; BMNH = British Museum (Natural History), London, U.K.; MHNG = Muséum d'Histoire Naturelle, Geneva, Switzerland; NMW = Naturhistorisches Museum, Vienna, Austria; NMV = Museum of Victoria, Melbourne, Australia; OUM = Oxford University Museum, Oxford, U.K.; SAMA = South Australian Museum, Adelaide, Australia; ZMB = Museum fur Naturkunde an der Universität Humboldt zu Berlin, Germany.



Archie McArthur started farming sheep and cattle near Millicent in 1948. Initially, rabbits were consuming more of the feed than were the stock. In time, as rabbits were controlled, a small eroded area was fenced to allow natural regeneration. As the soil stabilised and trees grew, ant species colonised the site and provided a laboratory at Archie's back door in which he studied the biology of this ant. He took specimens to CSIRO in Canberra where the species was identified. The absence of literature about this ant stimulated Archie's curiosity. On retiring from farming in 1990, he was welcomed by the South Australian Museum and commenced adding to the museum's collection and helped in classification. He has been made an Honorary Research Associate at the South Australian Museum and the Adelaide Zoo and has been awarded the Medal of the Order of Australia.

A Guide To
Camponotus
ANTS
Of South Australia

The SA Museum published in 1979 "A Guide to Ants of South Australia" by Dr John Greenslade, which for the next 20 years provided the only practical means of identifying ant genera in Australia. Archie McArthur now provides us with "A guide to *Camponotus* ants of South Australia". It provides the user with natural history of this fascinating group of ants, an excellent photographic (and scientific) key to identifying species. Its holistic approach will appeal to many walks of life, from those with no previous knowledge of ants to those in applied entomological or academic studies. In fact, Archie's guide-book will be one of the few practical sources to be able to identify ants to species and I am sure will be a very valuable addition to many field-workers for years to come.

Mark Stevens
Terrestrial Invertebrate Researcher
South Australian Museum



ISBN 978-0-9807291-0-8

